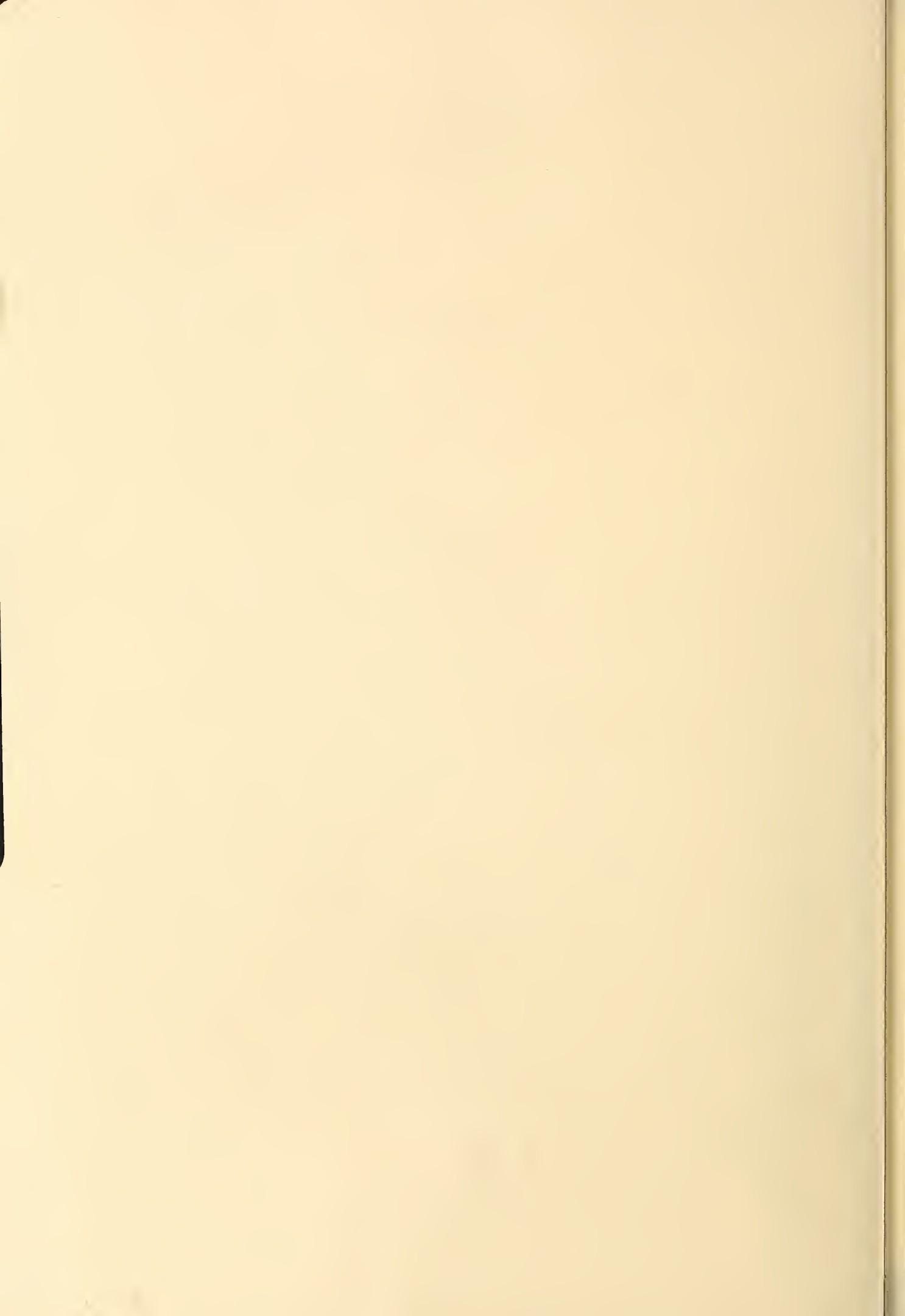


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November 1989



# Alaska Pulp Corporation Long-Term Timber Sale Contract

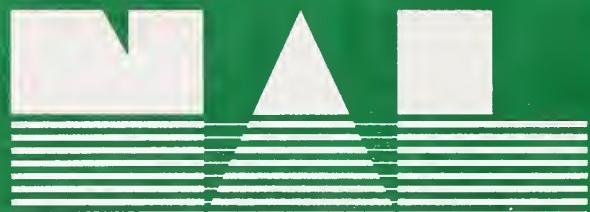
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Environmental Impact Statements  
for the 1981-86 and 1986-90  
Operating Periods

Analysis Area 3: Freshwater-Whitestone

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Final Supplement to the Environmental Impact Statements  
for the 1981-86 and 1986-90 Operating Periods

# Alaska Pulp Corporation Long-Term Timber Sale Contract

Analysis Area 3: Freshwater - Whitestone

U.S.D.A. - Forest Service  
Alaska Region  
Alaska

Lead Agency	Alaska Region U.S.D.A. Forest Service Federal Office Building P.O. Box 21628 Juneau, Alaska 99802-1628	
Responsible Official:	Michael A. Barton Regional Forester Alaska Region	
For Further Information Contact:	James W. Pierce SEIS Team Leader  U.S.D.A. Forest Service Alaska Region Federal Building P.O. Box 21628 Juneau, AK 99802-1628 (907) 586-8871	Gordon Anderson Chatham Area Team Leader  Tongass National Forest Chatham Area 204 Siginaka Way Sitka, AK 99835  (907) 747-6671

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# Abstract

In compliance with the National Environmental Policy Act of 1969 and in response to the Federal District Court case, *Tenakee Springs v. Courtright*, the Forest Service has supplemented the Environmental Impact Statements for the 1981-86 and 1986-90 Operating Plans for the APC Long-Term Sale. The Supplement was prepared in two phases. An earlier document, Phase I, provided information and analysis about a number of issues, and proposed four Analysis Areas that should be further evaluated for timber harvest and road construction through the balance of the Plan period. This document discusses the site-specific environmental impacts for Analysis Area 3 on northeastern Chichagof Island.

This document addresses the issues from the 1986-90 FEIS, the appeals issues, and the issues identified in the Court orders and Settlement Agreements including the Federal District Court case *Hanlon v. Barton*. Six alternatives were developed by the Forest Service to address the issues, the Contract and Tongass Land Management Plan requirements. The alternatives include the No-Action/Current Direction Alternative 1 and the No Further Harvest Alternative 2 along with four other action alternatives.

Alternative 1 proposes to harvest 63.3 million board feet (MMBF) and construct 21 miles of new road in 1989; in 1990, it would harvest 42.7 MMBF and build about 19 miles of road. Alternative 2 would complete all of the APC 1989 Operating Plan harvest (63.3 MMBF and 21 miles of road) but would defer additional harvest and road construction pending another environmental analysis.

The action Alternatives 3 through 6 would harvest timber volume and build new system roads in addition to what is proposed in Alternative 1. Alternative 3 would harvest a total of 139.6 MMBF and construct 51 miles of road; Alternative 4 would harvest 118.3 MMBF and construct 52 miles of road; Alternative 5 would harvest 116.8 MMBF and construct 55 miles of road; and Alternative 6 would harvest 99.5 MMBF and construct 39 miles of road. All of the alternatives would use the log transfer facilities (LTFs) at Kennel Creek, Long Island, Seal Creek, and possibly False Bay.

The analysis of effects concludes that any of the six alternatives would have varied impacts on the environment; these impacts fall within the guidelines of the Tongass Land Management Plan and other requirements. Likewise, the alternatives were found to be similar in addressing the issues, except for economic benefits, where the No Further Harvest Alternative 2 would have detrimental effects on the local economy as a result of curtailing timber harvest. The action Alternatives 1 through 6 would have beneficial effects related to the amount of volume proposed for harvest, with Alternative 3 resulting in the most benefits to the local economy.

The ANILCA Section 810 Subsistence Evaluation concluded: 1) that none of the alternatives would cause an immediate or reasonably foreseeable significant possibility of a significant restriction of subsistence use of fish, other foods, and timber resources, and 2) the potential effects from Alternatives 1 through 6 present a significant possibility of a significant restriction of subsistence uses of wildlife. The analysis concluded that long-term cumulative effects of reasonably foreseeable activities may significantly restrict subsistence use. Subsistence Hearings were held in conformance with Section 810 of ANILCA.

The Final SEIS recommends Alternative 3 as the preferred alternative, pending further consideration in the Record of Decision.



# Summary

In 1956, the Forest Service and Alaska Lumber and Pulp, now Alaska Pulp Corporation (APC), entered into a timber sale contract that terminates in 2011. Every five years, since implementation of the National Environmental Policy Act (NEPA), the Forest Service has prepared an environmental impact statement (EIS) for the succeeding Five-Year-Operating Plan.

The Federal District Court Case, *Tenakee Springs v. Courtright* challenged the adequacy of the 1981-86 Operating Plan FEIS under NEPA. In its 1987 decision, the Court found that the Forest Service would need to prepare a supplement to the 1981-86 FEIS to address issues raised by departures from the original 1981-86 Operating Plan. The departures have included the deletion or deferral of harvest units on lands selected for conveyance to Native corporations under the Alaska Native Claims Settlement Act (ANCSA) of 1971.

In addition to changing the Operating Plan, the Court identified three other issues requiring further analysis including: the need to consider a no-action alternative specific to the Upper Game Creek area of Chichagof Island, the need for more site-specific detail regarding environmental effects of alternative road and harvest configurations in the upper Game Creek area, and additional analysis in the Upper Game Creek area of the foreseeable cumulative impacts on the environment resulting from an expanding network of roads and harvest units.

The Forest Service decided to supplement both the 1981-86 and 1986-90 FEISs because both documents analyzed many of the same harvest areas and dealt with the same issues, and re-analysis of issues in the 1981-86 FEIS could affect the same issues in the 1986-90 FEIS. The Notice of Intent to produce the Supplemental EISs was published in the Federal Register October 15, 1987.

The EIS Supplement has been prepared in two phases. Phase I provided information and analysis of the issues, narrowing the focus from the whole APC Long-term Timber Sale area to four specific Analysis Areas, 2, 3, 6, and 12, that should be further evaluated for timber harvest and road construction through the balance of the Plan period, ending December 31, 1990. The present Phase II document presents site-specific environmental impacts of the proposed roads and harvest units in northeastern Chichagof Island, designated as Analysis Area 3.

This document uses four main chapters to discuss the purpose and need for supplementing the previous EISs, the alternatives including the proposed action, the existing conditions of the affected environment, and the environmental consequences of the alternatives as well as measures to mitigate adverse effects. A number of appendices contain supporting materials.

On the basis of the Phase I and Phase II SEIS analysis, the Regional Forester must decide:

- Whether or not the changes in land ownership, deferrals, deletions, or changes of timber-harvest units, and the effects of the Alaska National Interest Lands Conservation Act (ANILCA) subsistence legislation warrant amending the Records of Decision for the 1981-86 or 1986-90 FEISs.
- Whether or not the contractual timber commitments between the date of publication of this document and December 31, 1990 (end of the 1986-90 Operating Period) should be met from Value Comparison Units (VCUs) that have some existing access roads and harvest units.
- If the contractual commitments are not met from previously roaded VCUs, how much additional timber will be needed and from which VCUs the timber harvest will be scheduled.

The issues discussed in the 1981-86 and 1986-90 FEISs include:

1. The socioeconomic effects of logging and associated development on employment, business, populations, and quality of life.
2. The costs and benefits or trade-offs between environmental protection measures and the economics of the harvest activities.
3. The effects of timber harvest activities on fish habitat.
4. The effects of timber harvest activities on wildlife habitat.
5. The distribution of harvest by volume class.
6. The locations and environmental effects of log transfer facilities.
7. Maintaining resource values in high interest areas noted for fisheries, wildlife, recreation, or other values.
8. Effects on visual, recreation, and wilderness resources.

Other issues specified by the Court during the appeals process include consideration of a no-action alternative, consideration of effects on subsistence pursuant to Section 810 of ANILCA, and consideration of foreseeable long-term and cumulative effects of timber harvest. In 1988, a case (*Hanlon v. Barton*) filed in Federal District Court raised several issues regarding the effects of timber harvest near Hoonah on subsistence users. The Court recognized the merit of some claims which have implications for Analysis Area 3: consideration of a no further harvest alternative and consideration of "carryover" logging and road construction.

To address the issues and comply with NEPA regulations while meeting the APC Contract requirements, the Forest Service developed six alternatives for the Analysis Area 3 SEIS. Alternative 1, the No Action-Current Direction option, would permit the activities currently authorized by the Court to continue in nondeferred VCUs. This alternative would harvest 63.3 MMBF and construct about 21 miles of road in 1989. All of the alternatives will use an LTF at Seal Creek and might use an LTF at False Bay. During 1990, Alternative 1 would harvest 42.7 MMBF and build about 19 miles of road. A No Further Harvest option, Alternative 2, would involve completing all of the APC 1989 operating plan harvest units and roads but would defer any additional units and roads pending another environmental analysis.

Alternatives 3 through 6 propose to harvest additional timber volume and build more roads; their totals include the volume and road length proposed in Alternative 1. Alternative 3 proposes to harvest 139.6 MMBF and construct 51 miles of system road. This alternative would use the Kennel Creek logging camp and LTF along with the Long Island LTF and/or a temporary LTF at False Bay. Alternative 4 would harvest 118.3 MMBF and construct 52 miles of road. This alternative would use the LTF at Long Island or False Bay along with that at Kennel Creek.

Alternative 5 proposes to harvest 116.8 MMBF, construct 55 miles of new road, and use the Long Island and/or False Bay LTFs along with the Kennel Creek LTF. Alternative 6 proposes to harvest 99.5 MMBF, construct 39 miles of new road, and use the Long Island, Seal Creek, False Bay, and Kennel Creek LTFs.

None of the alternatives would locate roads or units on extreme hazard soils, reducing the potential to impact adversely soil productivity, mass wasting, and soil loss. The alternatives would alter noncommercial and understory species composition, affecting from about 6,000 acres (Alternative 6) to about 8,000 acres (Alternative 3). Precommercial thinning would be scheduled to accelerate both understory and remaining conifer growth rates for longer periods of time.

The alternatives would not impact much beach fringe; most would affect 1 percent or less with Alternative 6 affecting 3 percent. None of the alternatives would affect estuarine fringe, eagle sites, or inland wetlands. The alternatives would impact between 1 percent (Alternative 2, 4, and 5) and 3 percent (Alternative 6) of existing deer winter range. Likewise, the alternatives would impact small areas of streamside-riparian zones, ranging from under 0.5 percent (Alternatives 3, 4, and 5) to 2 percent (Alternative 1). Potential project effects on projected deer, brown bear, and pine marten habitat capability range from slight to substantial, particularly when project effects are combined with past effects and are carried into the foreseeable future.

Each of the action alternatives would encroach into some Aquatic Habitat Management Units (AHMU), ranging in Class I habitat from 2.3 (Alternative 2) to 8.5 (Alternative 3) miles of both sides of a creek. For Class II habitat, the figures range from 1.7 (Alternative 2) to 9.8 (Alternative 3) miles of one side of a creek, and from 1.5 (Alternative 2) to 6.5 (Alternative 3) miles of both sides of a creek.

The action alternatives would require AHMU protection measures for roads ranging from 0.3 (Alternative 2) to 2.4 (Alternative 4) miles. Each of the alternatives has little potential for changing stream flows, and the application of standards and guidelines to mitigate soils impacts is expected to result in only minor amounts of stream sediment.

Each of the alternatives has a little potential for impacting marine fisheries outside the sill, with little impact on salmon, herring, or crab expected.

None of the alternatives would affect land status. All of the action alternatives shift the recreation opportunities of some acres from Primitive I and Semi-primitive, Non-motorized to Roaded Natural or Roaded Modified where harvest activities take place.

The action alternatives fail to meet fully assigned visual quality objectives in two to three VCUs. Few impacts to cultural resources are expected. The Forest Service will conduct the inventory, evaluation, and mitigation of cultural resources sites according to a research design approved at implementation to avoid adverse impacts under any of the alternatives.

A Subsistence Evaluation was conducted pursuant to ANILCA Section 810, including public hearings held in subsistence communities in the vicinity of Analysis Area 3. It found that:

- A. The potential foreseeable effects from Alternatives 1 through 6 of the proposed project in Analysis Area 3 present a no, or only slight, significant possibility of a significant restriction of subsistence uses of fish, shellfish, timber and other foods.
- B. The potential effects from Alternatives 3 through 6 of the proposed project in Analysis Area 3 present a significant possibility of a significant restriction of subsistence uses of wildlife.

The Final SEIS Findings further project subsistence use may be significantly restricted in Analysis Area 3 from the results of implementing long-term management direction in the Tongass Land Management Plan, from future actions on other surrounding lands, and from adding those potential effects to the foreseeable effects of the proposed action.

The alternatives were found to be similar in evaluating most of the issues. Most of the issues concern environmental impacts, including effects on fish and wildlife habitat and the marine environment, visual resources, recreation, wilderness, and high interest areas, which were concluded to be minimal. The analysis found that none of the alternatives would harvest a significant amount or percentage of high volume stands.

Chapter 4 of the document identifies numerous measures applied to mitigate the adverse impacts of timber harvest activities. These measures are used to protect or enhance fish and wildlife habitat, protect aesthetic values, prevent landslides and windthrow, and improve

timber stands. Various Forest Service documents have discussed the standards, guidelines, monitoring, and mitigation measures in detail. Their purpose is to foresee and avoid or prevent potential problems in the planning phases of forest management. The potential effectiveness of proposed mitigation measures is also discussed.

Mitigation measures identified in Chapter 4 include, for example, creating irregular unit boundaries on visually sensitive units, using log yarding suspension requirements to protect sensitive soils, and providing signs to direct recreation traffic along the trails affected by harvest activities. Other mitigation measures consist of monitoring recreation use to determine the need for access restrictions, using streambank protection measures to maintain stable stream channels, using second-growth management techniques for areas of harvested deer winter range, and avoiding known cultural resources sites.

The alternatives differ considerably in economic benefits. The No Action-Current Direction Alternative 1 would support about 538 jobs in the 1989 harvest season and about 363 jobs result in 1990. Although the No Further Harvest Alternative 2 would support the same 538 jobs in 1989, no additional jobs would be maintained in subsequent years without further NEP Analysis.

Alternatives 3 through 6 would add additional volume to the 1990 volume of Alternative 1. This volume can be harvested between now and 1990 if APC increases its present logging capacity. At the present rate of harvest, this volume would provide carryover that would support jobs in 1991. Whether or not APC increases its current logging capacity will depend upon market conditions. Alternative 3 would provide the most volume, which would provide for about 1,032 jobs; Alternative 4 wold provide about 825 jobs; Alternative 5 would provide about 824 jobs, and Alternative 6, with the least volume, would provide about 672.

Alternative 1 would not meet the minimum volume projected for this area in the Phase I DEIS. It would require the Forest Service to make up the additional volume in other analysis areas, resulting in a possible breach of the contract if the volume could not be made up. This alternative is considered moderate in effectiveness in dealing with subsistence issues and brown bear population viability. It is considered moderated in effectiveness to implement TLMP guidelines for LUD III and IV VCUs.

Alternative 2 has the highest risk of causing the Forest Service to breach its contract with APC, because it fails to meet the minimum volume requirement projected in the Phase I DEIS and provides for less volume than the current situation. The Forest Service would have to make up 100 to 300 MMBF to meet contract obligations. This alternative is considered the most effective in responding to concerns over subsistence and brown bear viability, but is considered low in effectiveness to implement TLMP guidelines for LUD III and IV VCUs.

In proposing the highest level of timber harvest, Alternative 3 is considered the most effective at meeting the contract volume needs and the harvest level set in the Phase I DEIS. It is considered low in effectiveness at responding to concerns over subsistence and brown bear viability unless the proposed mitigation measures are adopted. This alternative would be highly effective in maintaining community stability in Hoonah and current employment levels for the logging contractors in the area and for the mills in Sitka and Wrangell. It is considered high in effectiveness to implement TLMP guidelines for LUD III and IV VCUs.

Alternative 4 barely meets the minimum volume projected in the Phase I DEIS. It is considered lowest at responding to concerns over subsistence and brown bear viability. This alternative would be moderately effective at maintaining community stability in Hoonah and current employment levels for logging contractors and the mills. It is considered moderate in effectiveness to implement TLMP guidelines for LUD III and IV VCUs.

Alternative 5 also barely meets the minimum volume projected in the Phase I DEIS. It would be moderate in effectiveness in responding to subsistence and brown bear viability concerns. This alternative would be moderately effective at maintaining community stability in Hoonah

and current employment levels for the logging contractors and the mills. It is considered moderate in effectiveness to implement TLMP guidelines for LUD III and IV VCUs.

Alternative 6 would harvest the lowest volume of any of the action alternatives and would be moderate to high in its effectiveness at responding to concerns about subsistence and brown bear viability. This alternative would be moderately effective at maintaining community stability in Hoonah and current employment levels for the logging contractors and the mills. It is considered moderate in effectiveness to implement TLMP guidelines for LUD III and IV VCUs.

The Chatham Area management team evaluated the benefits and impacts of each alternative and the issues to recommend the preferred alternative. Alternative 3 is tentatively identified as the preferred alternative, pending further consideration in the Record of Decision.



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# **Chapter 1**

## **Purpose and Need**





# Chapter 1

## Purpose and Need

This is one of four Phase II documents describing further environmental analysis conducted to supplement information previously provided in the Environmental Impact Statements (EISs) for the 1981-86 and 1986-90 Operating Periods for the Alaska Pulp Corporation (APC) Long-Term Timber Sale Contract. This Phase II document addresses site-specific environmental impacts attributable to road construction and timber harvest for a portion of Chichagof Island. This supplemental document is "tiered" to previous documents, which means that it builds on the analysis of the earlier documents. The information from the previous documents is hereby incorporated by reference and only significant conclusions or analyses from them are summarized here. The relationship or tiering of this document to earlier ones is shown in Figure 1-1. The reader is referred to the documents listed below for many of the details of ongoing issue discussions:

1. Alaska Pulp Corporation Long-Term Timber Sale Contract, Draft Supplement to the Environmental Impact Statements for the 1981-86 and 1986-90 Operating Periods, Phase I, August 1988 (Forest Service 1988a).
2. Notice of Intent to prepare a supplement to Environmental Impact Statements, published in the Federal Register on October 15, 1987 (Barton 1987).
3. Alaska Lumber and Pulp Company 1981-86 Operating Plan FEIS, 1980 (Forest Service 1980a).
4. Alaska Pulp Corporation 1986-90 Operating Period FEIS, 1986 (1986-90 FEIS) (Forest Service 1986b).
5. Tongass Land Management Plan (TLMP) and Final EIS, 1979 (Forest Service 1979a).
6. Tongass Land Management Plan, Amended, 1986 (Forest Service 1986d).

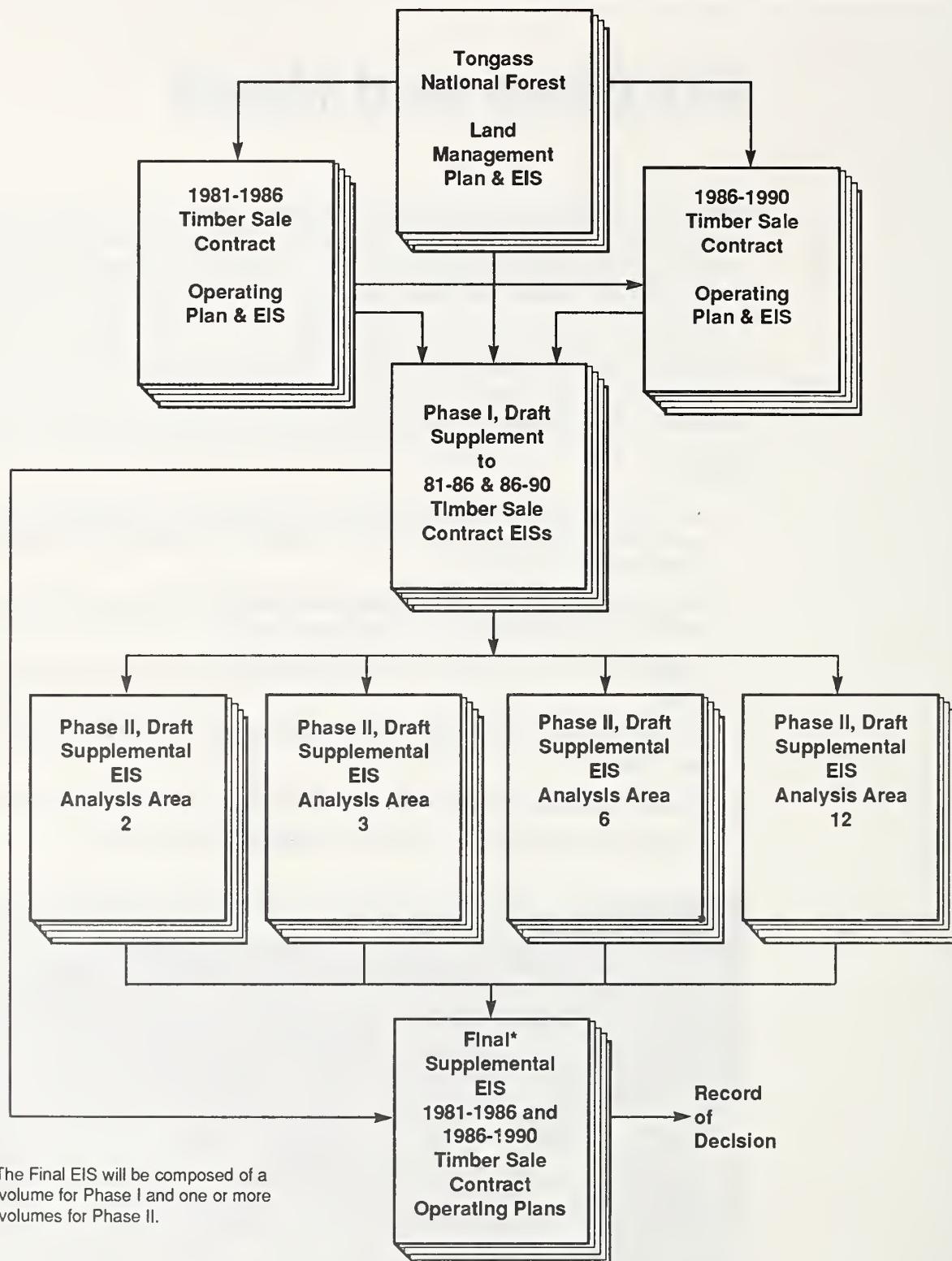


Hoonah, Alaska

# 1 Purpose and Need

Figure 1-1

## The Relationship of this Supplemental Environmental Impact Statement to Earlier Documents



*Upper End of Freshwater Bay*

7. Alaska Regional Guide, November 1983 (incorporated by reference into the Tongass Land Management Plan) (Forest Service 1983a).
8. Alaska Lumber and Pulp Company Timber Sale Contract; Contract Number 12-11-010-1545, 1956, with the Washington Office, Forest Service, Washington, D.C. (Forest Service 1956).

The supplement to the 1981-86 and 1986-90 FEISs (the SEIS) has been divided into two phases. Phase I concluded that there was not sufficient volume available from non-deferred harvest units to meet the Forest Service's obligations to APC in the APC contract area (Figure 1-2). Phase I, therefore, identified four specific geographic areas or analysis areas (Figure 1-3) for further analysis in Phase II. The Phase II SEIS documents site-specific environmental impacts that would be caused by road construction and timber harvest in the four analysis areas that should be entered by December 31, 1990 and compares a no-action alternative. This document addresses the Phase II studies for the portion of Chichagof Island designated as Analysis Area 3. The Analysis Area includes approximately 206,968 acres of National Forest lands, 30,081 acres in Native Corporation ownership, and 4,438 acres of Tenakee Springs Corporation and State of Alaska ownership. Analysis Area 3 includes VCUs 203 through 221. Areas in Native and other ownership, including VCU 206 and parts of 204, 205, 207, 208, 212, and 219 through 221, will be evaluated in this EIS. VCUs 203, 204, 205, 207, 208, and 209 have acreage available for Native selection.

This document, the Phase II SEIS for Analysis Area 3, is divided into four main chapters, as shown in Figure 1-4. Supporting material is included in appendices. Chapter 1, Purpose and Need, presents (1) a summary of the historical background for the reviewer to better understand the purpose of and need for supplementing the previous EISs and (2) the issues that were identified and are addressed in the following chapters. Chapter 2, Alternatives Including the Proposed Action, describes and compares the alternatives specifically developed to resolve the issues described in Chapter 1 and fulfill the APC Long-Term Contract. Chapter 3, Affected Environment, describes the existing conditions of the environment that would be affected by the actions associated with the alternatives. Chapter 4, Environmental Consequences, describes the potential consequences, or impacts, to that environment.

## Definitions

The majority of project-specific terms and acronyms are defined in the glossary in this document. However, clarification should be made on a few terms of geographical land subunits in the Tongass National Forest used by the Forest Service for administrative management: Value

# 1 Purpose and Need

Figure 1-2

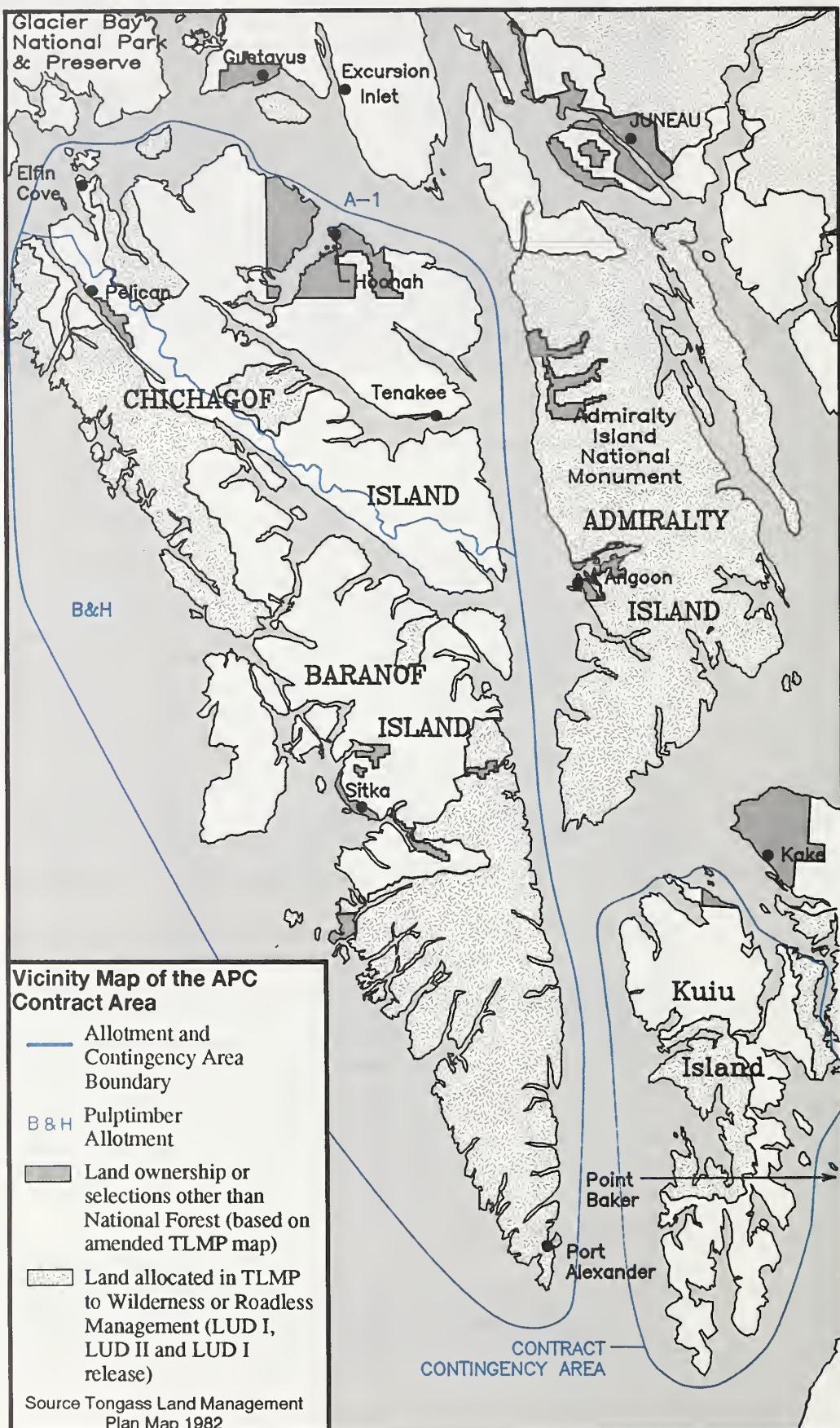
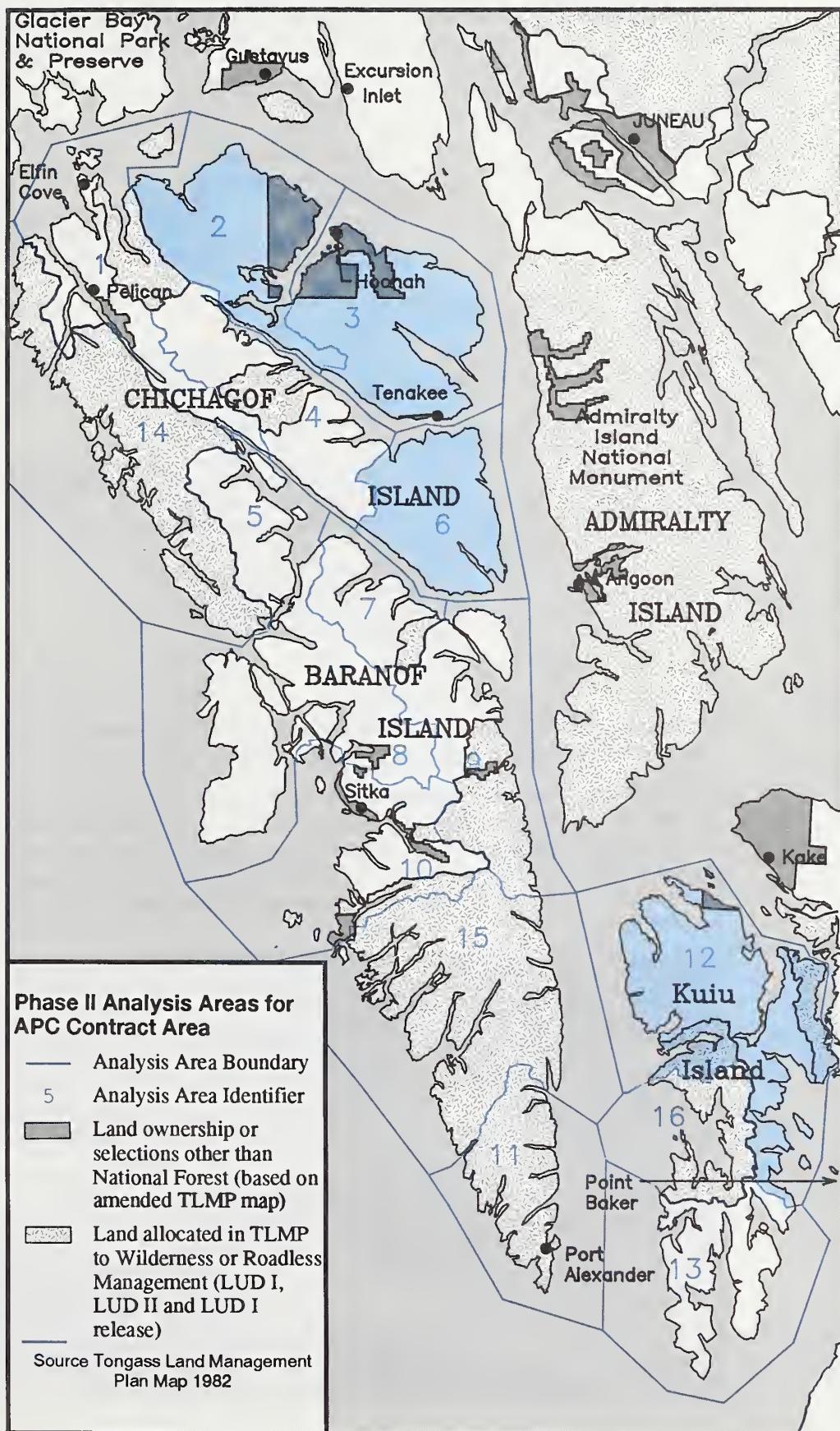


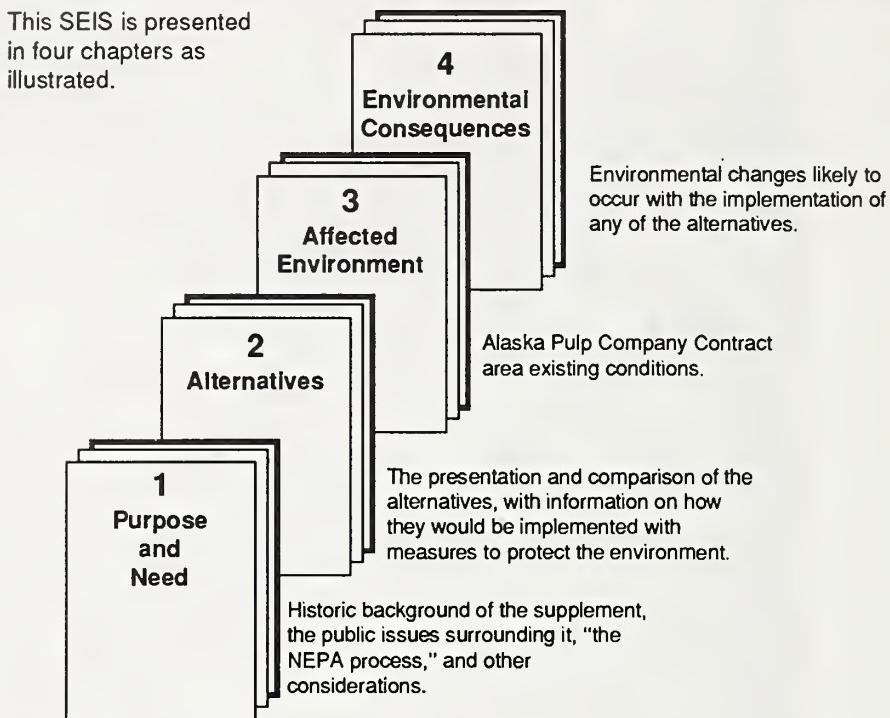
Figure 1-3



# 1 Purpose and Need

Figure 1-4

## How this Supplemental Environmental Impact Statement is Organized



Comparison Unit (VCU), deferred and nondeferred VCUs, Management Area, and Analysis Area. Figure 1-5 illustrates the hierarchical relationships of these subunits.

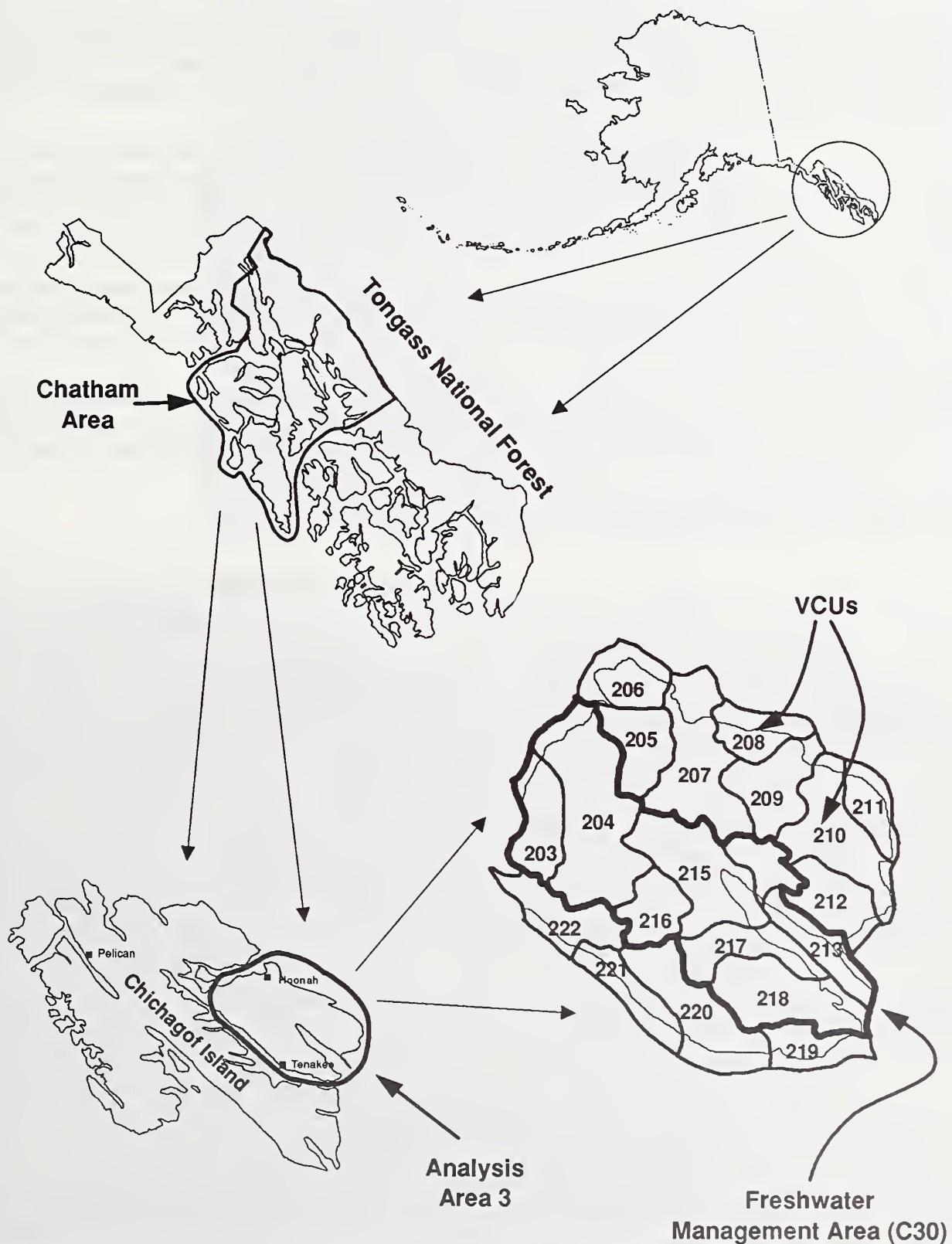
Value comparison units have been established in the Tongass National Forest in order to facilitate the use of a common set of resource inventories and interpretations of resource values for management purposes. A VCU is used as a planning unit and is defined as a geographically distinct area that generally encompasses a drainage basin containing one or more large stream systems. The boundaries of a VCU usually follow easily recognizable watershed divides. In



Kennel Creek Logging Community

Figure 1-5

### Geographical and Management Subunits



# 1 Purpose and Need

some cases, an island or a group of small islands comprise a single VCU. The VCUs average about 17,500 acres in size, Forest wide.

A deferred VCU is one in which further road construction and/or timber harvest is postponed pending completion of the supplement (*Tenakee Springs v. Courtright* Settlement Agreement, April 1988). All deferred VCUs are listed in the Notice of Intent (September 1987). The deferred VCUs in Analysis Area 3 are VCU 203, and portions of VCUs 204 and 216. The *Hanlon v. Barton* Settlement Agreement (February 1989) deferred certain harvest units and roads in VCUs 208, 209, 210, and 212, while allowing other harvest units and roads to proceed in those VCUs.

A nondeferred VCU is one in which timber harvest and road construction may proceed as scheduled in the 1981-86 and 1986-90 Operating Plans without being further evaluated in the SEIS (Settlement Agreement, April 1988). Additional harvest units and access roads will be considered in nondeferred VCUs as an alternative to entry into deferred VCUs. The non-deferred VCUs in Analysis Area 3 are VCUs 205 through 215, and 217 through 221.

Management areas, larger planning units identified in the Tongass Land Management Plan (Forest Service 1979a, 1986d), provide a broader perspective for forest management decisions. Management areas are composed of VCUs that have similar resource and physical characteristics.

Analysis areas generally are combinations of two or more management areas. The grouping of management areas is consistent with the direction found in the 1980-86 Tongass Land Management Plan Amendment (Forest Service 1986d) and is discussed in SEIS Phase I, Chapter 2.

Upper Game Creek



Logs Bundled Together Prior to Putting Them in the Water.



## Background

In 1956, Alaska Lumber and Pulp, now Alaska Pulp Corporation (APC), entered into a contract with the Federal government prescribing terms for timber sales and logging in Southeast Alaska for a 50-year period between 1961 and 2011 (Forest Service 1956). During that period, the contract provides for harvesting 4,974,700,000 board feet of sawlog grade timber within the sale, or contract area (Figure 1-2), which includes parts of Baranof, Chichagof, Kuiu, and associated islands.

Since 1971, the Forest Service, United States Department of Agriculture, has specifically planned and authorized logging, road construction, and related activities for successive five-year periods. The Forest Service has determined that these five-year Operating Plans are major federal actions significantly affecting the human environment, thus requiring preparation of an EIS under the National Environmental Policy Act (NEPA). Since the enactment of NEPA, an EIS has been prepared for each succeeding five-year Operating Plan. The EISs evaluate the proposed actions and the potential effects the Operating Plans may have upon the environment.

The Alaska Native Claims Settlement Act (ANCSA) (85 Stat. 688, as amended), was approved December 18, 1971 to provide for the settlement of certain land claims of Alaska natives. ANCSA has been the basis for conveying selected lands under administrative jurisdiction of the Tongass National Forest to Native corporations (any regional, village, urban corporation, or Native group). Under ANCSA, Native corporations have selected over 500,000 acres from the Tongass National Forest, but not all of the land has been conveyed to them. The selected and yet unconveyed lands remain in a state of suspension, unavailable for corporation management and restricted from public management. Some lands originally within the APC Long-Term Timber Sale area were selected and became unavailable to provide timber under the contract (Table 1-1).

Table 1-1

## Native Corporation Land Selections Within Analysis Area 3

Corporation	VCU	Acres Selected and Conveyed	Acres Selected but Not Conveyed
Huna Totem	203	—	—
	204	48	—
	205	1,503	1,571
	206 <sup>1</sup>	4,870	—
	207	10,846	6,118
	208	132	2,995
	209	—	2,182
	Subtotal	17,399	12,866
Sealaska	203	—	2,183
	204	6,389	6,569
	205	6,293	3,596
	207	—	674
	Subtotal	12,682	13,022
Total		30,081	25,888

SOURCE: SEIS Planning Record.

<sup>1</sup> VCU 206 is currently all Native owned.

On December 2, 1980, the Alaska National Interest Lands Conservation Act (ANILCA), Public Law 96-487, was enacted to provide for the designation and conservation of certain public lands in the State of Alaska. This act established a number of areas for the purpose of preserving them for the benefit, use, education, and inspiration of present and future generations. Title VII of the Act resulted in 2,592,600 acres or about 32 percent of the Chatham Administrative Area (which includes Analysis Area 3) becoming wilderness. Another 17,200 acres became nonwilderness National Monument. Title VIII of the Act addressed the use of public lands for subsistence uses; the customary and traditional uses by rural Alaska residents of wild, renewable resources. In addition, Section 705(a) of the Act provided funding to maintain a timber supply from the Tongass National Forest of 4.5 billion board feet per decade.

The enactment of ANILCA and ANCSA changed the status of land administration in the Tongass National Forest. The Record of Decision for the 1981-86 Operating Period Plan was signed April 11, 1980 with an implementation date of January 1, 1981. The Court case *Tenakee Springs v. Courtright* challenged the adequacy of the Final EIS for the 1981-86 Operating Plan. In a Memorandum and Order (June 26, 1987) the Court concluded that the EIS for the 1981-86 Operating Period required supplementation because of the following issues:

1. Since preparation of the FEIS for the 1981-86 Operating Period, actions related to ANCSA have resulted in the deletion or deferral of harvest units, thereby changing the Operating Plan.
2. Consideration of a no-action alternative specific to Upper Game Creek (Chichagof Island) is required.

3. Inadequate site-specific detail was provided regarding environmental effects of alternate road and harvest configurations in the Upper Game Creek area.
4. Additional analysis in the Upper Game Creek area may be necessary if land conveyances to Native Corporations change the management practices on neighboring lands, and consideration is necessary of the foreseeable cumulative impacts on the environment due to a steadily expanding network of roads and harvest units in the vicinity of Upper Game Creek.

In the Memorandum and Order, the Court required the preparation of a supplement to the FEIS for the 1981-86 Operating Period to improve the site-specific analysis of the Upper Game Creek area and address the other issues raised. The Court prohibited road construction and logging operations in that area pending completion of the supplemental analysis.

A Settlement Agreement in the *Tenakee Springs v. Courtright* case was filed April 20, 1988. As a part of the Settlement Agreement the Forest Service agreed to prepare a supplement to the FEIS for the 1981-86 Operating Period. The Settlement Agreement deferred road construction and timber harvest in certain areas (deferred areas) and authorized activities to proceed in other areas (nondeferred areas) without further consideration in the supplement.

The Forest Service published a Notice of Intent in the Federal Register on October 15, 1987, to announce the preparation of a supplement to the FEISs for both the 1981-86 and 1986-90 Operating Periods. The issues identified by the Court and other issues of concern to the Plaintiffs in the *Tenakee Springs v. Courtright* lawsuit not only pertain to the FEIS for the 1981-86 Operating Period, but extend to areas included in the FEIS for the 1986-90 Operating Period, since many of the same timber-harvest areas were analyzed in both FEISs and many of the same issues were addressed in each Operating Period. There was a need to further address the issues pertaining to both the 1981-86 and 1986-90 Operating Period FEISs because of new in-



Traditional Tlingit Canoes  
are Carved From a Spruce  
Tree; this Carving was  
Directed by Hoonah Elder,  
George Dalton, Sr.

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Entering Huna Totem Corporation Land.

formation and circumstances. For example, the Court identified Upper Game Creek as requiring more site-specific analysis, analysis of a no-action alternative, and discussion of foreseeable cumulative effects. However, the same arguments can apply to any similar geographic unit or local project. Therefore, the Notice of Intent stated that the Supplement process will evaluate a no-action alternative specific to each drainage or similar geographic area and will include the following three issues:

1. Additional analysis will be conducted on site-specific and cumulative environmental impacts associated with alternative road and timber harvest configurations included in the 1981-86 and 1986-90 Operating Plans (equivalent to the analysis for Upper Game Creek).
2. Pursuant to Section 810 of ANILCA, analysis will be conducted of the effect on subsistence resources and uses of the alternatives considered in the SEIS. (Subsistence was not separately considered in the 1981-86 FEIS because ANILCA was enacted after approval of that EIS. Subsistence was analyzed in the 1986-90 FEIS.)
3. Mitigation measures will be developed and evaluated for the alternatives considered in the SEIS.

The Phase I Draft SEIS was issued for review in August of 1988. Comments received are addressed during the Supplement process and are responded to in the Final SEIS as are the comments that have been received for the Phase II Draft SEIS.

On July 31, 1988, several residents of Hoonah, Alaska, and others filed a lawsuit (*Hanlon v. Barton*) challenging the adequacy of the 1986-90 Plan FEIS with respect to activities planned near Hoonah. They claimed that activities proposed in the 1986-90 Operating Plan would significantly restrict subsistence uses, that evaluations of environmental and subsistence values were not site-specific, that the Forest Service must evaluate cumulative subsistence impacts of reasonably foreseeable future actions, that the Forest Service failed to consider a no-action alternative, and that there was a failure to evaluate impacts of "carryover" logging and road construction. On November 14, 1988, the Court denied a motion for preliminary injunction, but recognized the merit of some claims. Three of these claims have implications for Analysis Area 3; consideration of a no-action alternative, consideration of carryover logging and road construction, and subsistence evaluations.

The 101st Congress is considering legislation known as the "Tongass Timber Reform Act". The House of Representatives passed H.R. 987 on July 13, 1989, and the Senate is reviewing a similar bill, S.B. 346, at the time of this writing. As passed by the House of Representatives, that legislation would cancel the long-term timber sale contracts with the Alaska Pulp Corporation and the Ketchikan Pulp Company. It would also require "a buffer zone of a minimum of 100 feet in width within which logging shall be prohibited on each side of all anadromous fish streams in the Tongass National Forest, and their tributaries, except those tributaries with no resident fish populations which are intermittent in flow, or have flow of inadequate magnitude to directly influence downstream fish habitat." Other provisions of this bill include prohibiting a road connection between the Indian River and Game Creek road systems, certain other management directions, and designation of 23 additional areas as wilderness. Six of the 23 areas are within the APC long-term contract area. None of the proposed wilderness areas are in Analysis Area 3.

## Management of the Analysis Area

As previously stated, this document is the Phase II SEIS for Analysis Area 3, which is located on Chichagof Island. Analysis Area 3 is approximately 241,487 acres in size and is administered by the Chatham Area Office of the Tongass National Forest in Sitka. It includes three management areas and 19 VCUs as designated in the current Tongass Land Management Plan (Forest Service 1986d) as follows:



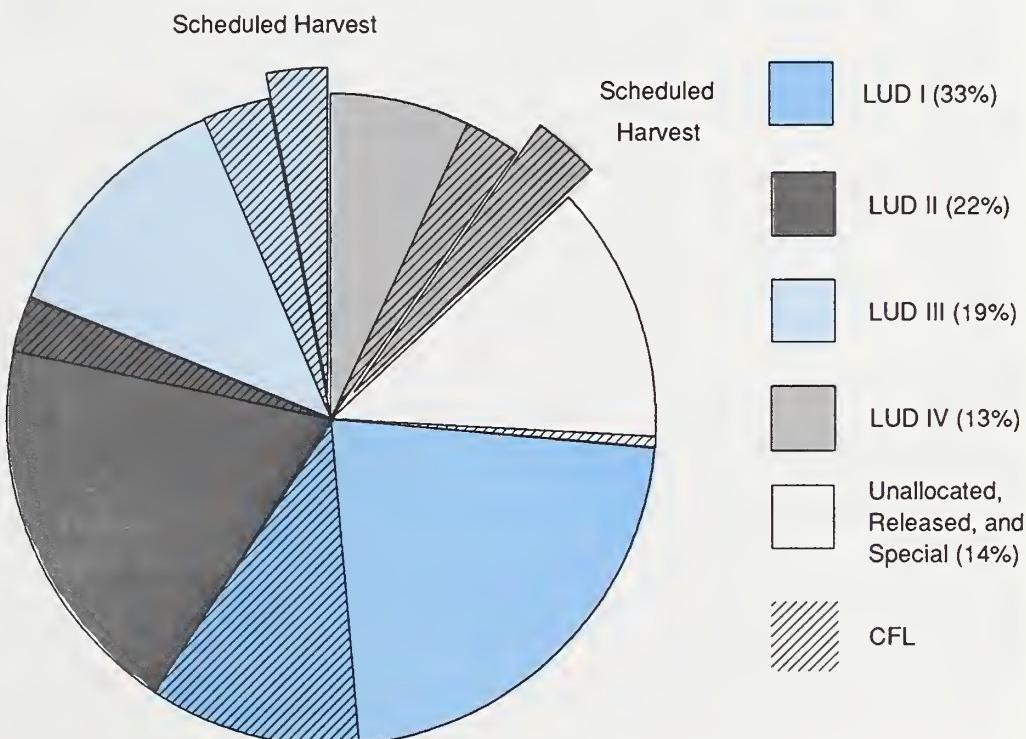
- Freshwater Management Area C30: VCUs 213, 215, and 218 (LUD III) and VCUs 203, 204, 214, 216, 217 (LUD IV)
- Whitestone Management Area C31: VCUs 205 through 212 (LUD IV)
- Tenakee Management Area C32: VCUs 219 and 220 (LUD III) and VCU 221 (LUD IV).

The current Tongass Land Management Plan (Forest Service 1986d) divided the forest land into four Land Use Designations (LUDs) and defined the purposes and management implications of each. Areas designated as LUD I were suitable for recommendation for inclusion in the National Wilderness System and are managed as such. Land Use Designation II areas are generally maintained in a roadless state, but with fewer restrictions than LUD I lands. No commercial timber harvest is allowed on either LUD I or LUD II lands. The LUD III designated areas are managed for both amenity values (e.g., scenic and recreational uses) and commodity-oriented uses (e.g., timber harvest) in a compatible manner to provide the greatest combination of benefits. Such areas usually have high values of both types. The lands designated as LUD IV provide opportunities for intensive development of resources. These areas are managed in favor of commodity production (e.g., timber production) while protecting the long-term physical and biological productivity. The relative proportions of these LUDs in the Chatham Area are illustrated in Figure 1-6.

The Freshwater Management Area (C30) is divided between LUD III and LUD IV designations

Figure 1-6

### Distribution of Land Use Designations (LUDs), Commercial Forest Land, and Scheduled Timber Harvest<sup>1</sup> in the Chatham Area<sup>2</sup>



<sup>1</sup> Scheduled timber harvest refers to Tongass Land Management Plan projections for the whole crop rotation.

<sup>2</sup> From the current Tongass Land Management Plan (Forest Service 1986d).

# 1 Purpose and Need



*The Hoonah Packing Company,  
Fish Processors Since 1912.*

in the current Tongass Land Management Plan. The management direction or emphasis specified in the Plan is to continue road construction, bridge replacement, and timber sale preparation, and to continue fish and wildlife habitat and recreation enhancement programs.

The Whitestone Management Area (C31) is designated as LUD IV. The management direction in the current Tongass Land Management Plan includes emphasis on timber harvest and road construction, and fish and wildlife habitat enhancement projects. Land conveyances to Native Corporations will continue.

The Tenakee Management Area (C32) is mostly designated LUD III with one VCU (221) designated as LUD IV. The TLMP management direction includes continuation of timber harvest and regeneration activities, bridge replacement, and beach log harvest. It also indicates that the Indian River will be stocked with king salmon.

The management decisions that are being considered in this SEIS fit within the framework of the management guidelines set forth in the most recent version of the Tongass Land Management Plan. In ANILCA, Congress authorized funding to provide for 4.5 billion board feet of sawlog volume to be made available from the Tongass National Forest per decade. According to TLMP data (Forest Service 1986d, pg. 5), the Chatham contribution to meeting ANILCA volume is up to 120.6 million board feet per year. The Management Areas where timber may be harvested have been established in TLMP. As illustrated in Figure 1-6, TLMP includes 54 percent of the Chatham Area as wilderness or roadless area, and an additional 13 percent is being managed so as not to preclude such designation in the future. Within the Chatham Area, about 16 percent of the LUD III lands and 25 percent of the LUD IV lands are scheduled for timber harvest on a 100- to 120-year timber crop rotation. Analysis Area 3 contains about 3 percent of the land area of the Chatham Administrative Area, about 16.1 percent of the LUD IV lands, and about 4.6 percent of the LUD III lands of the Chatham Area. No LUD I or LUD II lands occur within the Analysis Area. All the proposed timber harvest in Analysis Area 3 would be in LUD III or LUD IV areas designated by TLMP for commodity production.

## Purpose and Need

Federal action is required to provide the volume of timber needed to satisfy contractual obligations with APC until December 31, 1990, and to assure a smooth transition to future timber harvest activities. The range of sawlog volume needed within Analysis Area 3 to meet this obligation was discussed in the Phase I Draft SEIS (Chapter 2, page 32) as 250 to 280 million board feet (MMBF) of timber, 194.3 MMBF of which was available, at the time of the Phase I analysis, from nondeferred VCUs. Approximately 63.3 MMBF is expected to be harvested by the end of the 1989 logging season.

The contents of this Phase II SEIS document respond to the issues identified in the *Tenakee Springs v. Courtright* and *Hanlon v. Barton* Settlement Agreements and further address the environmental effects associated with meeting contractual obligations of timber volume to APC from Analysis Area 3. The results of the Phase II analysis were presented in the Draft SEISs for review and comment. This Final SEIS responds to public and agency comments. The FEISs for the 1981-86 and 1986-90 Operating Periods and the SEIS documents (Phase I and II Drafts and Final SEIS) serve as a basis for the selection of a preferred alternative and the Regional Forester's Record of Decision.

*"Round Logs" Harvest from  
Native Corporation Lands  
Being Loaded on a Freighter  
at Hoonah.*



# 1 Purpose and Need



*Forest Service Planners Review Locations of Proposed Timber Harvest Units.*

To formulate a Record of Decision, the Regional Forester must decide:

- if the changes in land ownership, deferrals, deletions, or changes of timber-harvest units, and the effects of ANILCA subsistence legislation warrant modifying the Records of Decision for the 1981-86 or 1986-90 FEISs,
- if the contractual timber commitments between the date of publication of the Draft Supplement and December 31, 1990 (end of the 1986-90 Operating Period) should be met from nondeferred VCUs (205 through 221) that have some existing access roads and harvest units, and
- if the contractual commitments are not met from these nondeferred VCUs, how much additional timber will be needed and from which VCUs the timber harvest will be scheduled.

## Public Involvement

Issues addressed in this document were identified from the results of the public involvement programs for the 1981-86 and 1986-90 FEISs (Forest Service 1980a, 1986b), the issues identified by the Court in *Tenakee Springs v. Courtright* (1987) and *Hanlon v. Barton* (1988), the issues identified in the Notice of Intent to prepare the Supplemental EISs (Barton 1987), and from comments on the Draft SEISs. Additional scoping of issues was not undertaken prior to beginning the Supplement process; however, the possibility of currently pending national legislation for the Tongass National Forest is addressed.

All comments received during the Supplement process are considered and become part of the record. Review comments have been received on the Phase I Draft SEIS and on the Phase II Draft SEIS. Subsistence hearings provided additional opportunities for public response to subsistence issues related to SEIS alternatives. The Forest Service held subsistence hearings during the comment period on the Draft SEIS in 11 subsistence communities. Comments received in the subsistence hearings are part of the subsistence hearing record (Consolidated Appendix, Volume I, B). Comments received after the hearings relating to subsistence are considered as



*Mother Brown Bear Teaches Her Cub How to Fish.*

comments to the Draft SEIS and have been included in the Consolidated Appendix, Volume II, C-2. Such comments were analyzed and evaluated in the Final SEIS along with the other responses to the Draft SEIS.

## Issues

The issues that were identified by the Court in *Tenakee Springs v. Courtright* and *Hanlon v. Barton*, and the issues identified in the Notice of Intent are provided in the Background section above. In addition, some issues addressed in the 1981-86 and 1986-90 FEISs must be evaluated in the Supplement. The following section summarizes the issues carried forward from the 1981-86 and 1986-90 FEISs (including appeals issues), identifies which aspects of the issues will be addressed, and lists the issues outside the scope of the SEIS. The management concerns and management opportunities addressed in the 1986-90 FEIS are addressed within the issues and analysis in this SEIS.

### Issues Described in the 1981-86 and 1986-90 FEISs

#### Issue 1:

Socioeconomic Effects of Logging and Associated Development. This issue reflects public concern about effects on community employment, business, and population and on lifestyles and quality of life. Each of these aspects are addressed in this SEIS.

#### Issue 2:

Costs and Benefits. This issue refers to the trade-offs between environmental protection measures and the economics of the harvest activities. The SEIS alternatives are compared on the basis of factors that affect harvesting and management costs and various benefits.

#### Issue 3:

Effects of Timber Harvesting and Related Activities on Fish Habitat. The fishing industry is the largest industry in Southeast Alaska. There is high public concern that timber harvesting not be allowed to reduce salmon production. The Forest Service applies extensive and stringent standards and guidelines on roads and timber harvest to prevent such impacts. This issue is addressed in this SEIS and also evaluated as it relates to socioeconomics and subsistence issues.



# 1 Purpose and Need

## **Issue 4:**

Effects of Timber Harvest and Related Activities on Wildlife Habitat. This issue includes concern over several notable wildlife species and the habitats most important to them. Much of the old-growth habitat with perceived high value to wildlife is also high volume timber. This SEIS evaluates the effects on important wildlife and wildlife habitat. This issue is closely related to the subsistence effects issue.

## **Issue 5:**

Distribution of Harvest Volume Classes. This issue spans the concern that harvesting too many high-volume stands will unduly affect fish and wildlife habitat and, alternatively, that high-volume stands are the only stands that can be economically harvested to maintain a viable industry. Both aspects of this issue are addressed in this SEIS.

## **Issue 6:**

Log Transfer Facility Locations and Environmental Effects. The issue of the placement of log transfer facilities includes concerns about effects on marine organisms, recreation, subsistence, and commercial fisheries. These concerns are addressed in this SEIS.

## **Issue 7:**

Maintaining Resource Values in High Interest Areas. Certain areas were recognized during the 1986-90 FEIS process as "high-interest" areas because of noted fisheries, wildlife, recreational, wilderness, or other values expressed by agencies, groups, and individuals.

Analysis Area 3 has several high interest areas. The FEIS for the 1986-90 Operating Period addressed how resource values in high interest areas would be maintained. Within Analysis Area 3, VCU 218 (Pavlof) is listed as a high interest area because the Alaska Department of Fish and Game commented in the FEIS about its fisheries and wildlife values. Other groups and individuals also expressed concern about the Tenakee Inlet areas (VCUs 219 through 221) and the Freshwater Bay Road.

## **Issue 8:**

Effects on Visual, Recreational, and Wilderness Resources. This issue concerns a specific desire to maintain the primitive character of many areas in Southeast Alaska because of values other than for timber. This issue is addressed in the evaluation of alternatives in this SEIS.

## **1986-90 Administrative Appeal Issues**

After the Record of Decision (ROD) for the 1986-90 Operating Period FEIS was signed by the Regional Forester, there were eight separate administrative appeals of the decision. Five of these appeals are awaiting review and decisions by the Chief of the Forest Service. At least one of the appeals states that the Environmental Impact Statement does not comply with the:

- National Environmental Policy Act (NEPA)
- National Forest Management Act (NFMA)
- Alaska National Interest Lands Conservation Act (ANILCA)
- Resources Planning Act (RPA)
- National Historical Preservation Act (NHPA)

Concerns covered such subjects as: subsistence, Native cultural existence, wildlife habitat, wildlife populations, habitat for finfish and shellfish, bald eagle nest trees, feeding and nesting habitat for various species, and harvest of deer and bear. There were concerns expressed that the 1986-90 Planning Process, in a variety of ways, failed to consider reasonable alternatives; failed to assess long-term and cumulative impacts; inadequately discussed environmental impacts; failed to demonstrate effectiveness of and intent to implement mitigation measures; and failed to display adequate site-specific information.

*The Forest Service Requires  
Contractors to Adhere to  
Permit Conditions During  
Road Construction.*



The concerns expressed in the appeals were reviewed and considered by the Interdisciplinary Team. A more detailed summary of Statements of Reasons presented in these appeals can be found in Consolidated Appendix, Volume III, G.

## **Issues Outside the Scope of this SEIS**

The issues addressed in this SEIS document are those issues identified in the Phase I Draft SEIS. They include the issues required by the Court and issues from the 1981-86 and 1986-90 FEISs that are being re-analyzed.

Issues identified as being outside the scope of the 1986-90 FEIS included:

1. Can the harvest supply target of 4.5 billion board feet of timber per decade for the Tongass National Forest be lowered?
2. Can the Tongass Land Management Plan land use designations be changed?
3. Can the APC Contract be cancelled, bought out, or renegotiated?

These issues are also considered outside the scope of this SEIS (see Consolidated Appendix, Volume III, F).

One issue that was considered outside the scope of the 1986-90 FEIS, but which is addressed in the SEIS, is the reasonably foreseeable cumulative effects during the life of the APC Long-Term Timber Sale Contract (through the year 2011). The 1986-90 FEIS used a longer planning horizon to predict long-term environmental effects (to 2080). The Supplement evaluates effects to 2011, the end of the APC contract, as being reasonably foreseeable, and tiers to the 1986-90 Plan evaluation for longer term forecasts.

## **Permits and Licenses**

To proceed with the timber harvest as addressed in the SEIS, permits from other agencies must be obtained. Administrative actions on these permits would take place 30 days after the Final SEIS is filed with the Environmental Protection Agency. The agencies and their responsibilities are listed below.

# 1 Purpose and Need

US Army Corps of Engineers:

- Approval of discharge of dredged or fill materials into the waters of the United States under Section 404 of the Clean Water Act.
- Approval of construction of structures or work in navigable waters of the United States under Section 10 of the Rivers and Harbors Act of 1899.

Environmental Protection Agency:

- National Pollutant Discharge Elimination System Review (Section 402 of the Clean Water Act)

State of Alaska, Department of Natural Resources:

- Tideland Permit and Lease or Easement

State of Alaska, Department of Environmental Conservation:

- Solid Waste Disposal Permit
- Certification of compliance with Alaska Water Quality Standards (Section 401 of the Clean Water Act)

United States Coast Guard:

- Coast Guard Bridge Permit (in accordance with the General Bridge Act of 1946) required for all structures constructed within the tidal influence zone

Major Legislation Relating to the EIS:

- National Environmental Policy Act of 1969 (as amended)
- Forest and Rangeland Renewable Resources Planning Act of 1974
- National Forest Management Act of 1976
- Clean Water Act of 1977

Coastal Zone Management Act of 1976 (CZMA)

- The Alaska Coastal Management Program (ACMP) developed under CZMA contains the standards and criteria for a determination of consistency for activities within the coastal zone. Although Federal lands are excluded from the Coastal Zone, the Coastal Zone Management Act of 1976 requires Federal agencies conducting activities or undertaking development directly affecting the coastal zone to ensure that the activities or developments are consistent with approved State management programs to the maximum extent practicable. The alternatives have been evaluated by the Forest Service against the applicable provisions (Timber Harvest and Processing, 6 AAC 80.100) of the ACMP and found to be consistent to the maximum extent practicable.

# **Chapter 2**

## **Alternatives Including the Proposed Action**





# Chapter 2

## Alternatives Including the Proposed Action

In Chapter 1, the background, issues, concerns, and opportunities associated with the decisions on the Operating Plans for the APC Long-Term Timber Sale Contract for Analysis Area 3 were described. Chapter 2 describes the alternatives that were developed to resolve the issues and concerns. The alternatives are also compared in Chapter 2 by using the conclusions from the analysis of the environmental consequences of each alternative found in Chapter 4 of this document. This chapter presents a summary of the conclusions reached in Chapter 4 on the basis of detailed analysis.

The management objectives and criteria used to formulate the alternatives are discussed below. Following that, the alternatives initially considered, but eliminated from detailed evaluation are described. Then the alternatives being evaluated in this document are described and compared in terms of their environmental consequences, their effectiveness in meeting the contract needs, and the management opportunities each offers. Chapter 2 concludes with a discussion of applicable standards, guidelines, and mitigation measures.

*Logs Harvested in VCU 209  
Being Loaded for Transport  
to an LTF*



## Formulation of Alternatives

The National Environmental Policy Act (NEPA) and the Council on Environmental Quality (CEQ) regulations implementing NEPA (40 CFR 1502.14) require that a wide range of alternatives, including a no-action alternative, be developed for projects requiring an EIS. The alternatives were formulated in response to the issues, concerns, and opportunities described in Chapter 1 of this Supplement. They tier to the alternatives considered in Chapter 2 of the Phase I Draft SEIS (Forest Service 1988a). Constraints considered during alternative development include (1) the SEIS time frame (until the end of the APC 1986-90 Operating Period, (2) the time needed to obtain permits for and complete construction of log transfer facilities, and (3) the time required to construct roads for access to harvest units in Analysis Area 3. The need to protect resources by dispersing harvest activities geographically as well as through time was also a consideration in the formulation of the alternatives. This meant that some stands of timber that were accessible and available for harvest were not considered for harvest in this SEIS so as to not compound the effects on visual, soil, water, and fishery resources of recent nearby harvests. A total of six alternatives, including the No Action Alternative and the No Further Harvest Alternative, were developed and evaluated for Analysis Area 3.

The Interdisciplinary Team used the following management objectives to formulate the alternatives. All alternatives will meet Federal, State, and local laws and regulations and be designed in compliance with applicable Forest Service Manual and Handbook direction.

- Implement the Tongass Land Management Plan (TLMP).
- Design Land Management activities to minimize the potential of slopes from landsliding.
- Maintain floodplain stability.
- Meet State Water Quality Standards especially with reference to sediment.
- Ensure cost effective means of project implementation.
- Plan, develop, and operate a network of transportation modes that provide for user safety, convenience, and efficiency to accomplish land and resource management objectives.
- Meet Alaska Pulp Corporation contractual obligations.
- Protect eagle nesting and roosting habitats.
- Meet or exceed the prescribed number of acres of wildlife habitat in accordance with TLMP for Analysis Area 3.
- Protect anadromous fish stocks and maintain the productivity of fish habitat.
- Minimize the risk of blown down trees.
- Maintain recreational opportunities of developed recreation sites.
- Provide for a variety of recreational opportunities commensurate with demand on northeast Chichagof Island without precluding future opportunities.
- Manage visual resources using the visual guidelines approved in TLMP.
- Provide for continued subsistence use opportunities.

*Sawyer Bucks a Recently Fallen Tree into Proper Log Lengths*



## Alternatives Considered But Eliminated From Detailed Study

During the development of alternatives, several alternatives were initially considered, but for various reasons, were not fully developed or analyzed and were eliminated from further detailed study.

Alternatives eliminated from detailed study in the Phase I SEIS, including those from the 1981-86 and 1986-90 FEISs, are not repeated in this document. Refer to Chapter 2 of the Phase I Draft SEIS for a discussion of alternatives eliminated earlier. It should be noted that a given harvest unit can be considered for harvest in more than one alternative. Therefore, elimination of an alternative does not necessarily remove the individual harvest unit from further consideration. Listed below are the alternatives eliminated from further consideration along with an explanation of why they were eliminated.

- A. An alternative was considered that would harvest timber in VCU 216. The primary options for moving the harvested timber would be to use the existing Indian River log transfer facility site (the facility is gone) or to connect the road through the Game Creek drainage to the Hoonah-Kennel Creek road. As stated in the Phase I Draft SEIS, during public scoping for the 1981-86 and 1986-90 FEISs and in litigation on these EISs, the City of Tenakee Springs made it known that they did not wish the Indian River LTF (located within the City limits about 2 miles east of the town center) reopened. A hiking trail is maintained between Tenakee Springs and the terminus of the Indian River Road. This trail has been used by all-terrain vehicles (ATVs), although vehicles have been prohibited since 1977 by City ordinances. Residents of Tenakee Springs have also indicated concern about a possible road connection between the Indian River Road and Hoonah. Other options for transfer of timber cut from VCU 216 were considered too costly or impractical during the SEIS time period. Given the sensitivity of activities in this VCU, further consideration of activities are being deferred to the TLMP revision. Therefore, this alternative was dropped from further consideration.
- B. An alternative proposed harvest of only the ROD-approved units in deferred VCUs 203 and 204. No additional harvest was proposed. This alternative was eliminated because its activities are covered in Alternative 3.

## Alternatives Evaluated In This EIS

The Court in the case of *Hanlon v. Barton* indicated that the No Action Alternative as presented in the 1986-90 FEIS was inadequate. Therefore, a no further harvest alternative is presented in addition to the no action - current direction alternative. In Analysis Area 3, the Court-authorized timber harvest activities, based on the *Tenakee Springs v. Courtright* Settlement Agreement (Appendix A-2 of the Draft SEIS), will require both the 1989 and 1990 operating seasons to complete. Since the Record of Decision (ROD) for the Supplemental EIS is not expected until about the end of the 1989 operating season, the Court-authorized timber volume that will be harvested during the 1989 operating season affects the description of all the alternatives. The alternatives are described below.

### Alternative 1 - No Action-Current Direction

Alternative 1 continues timber harvest activities currently authorized by the Court in *Tenakee Springs v. Courtright* and *Hanlon v. Barton*. This includes the harvest of 39.9 MMBF on 1,609 acres in VCUs 209, 210, 212, 214, 215, and 218. In addition, APC's 1989 operating plan included the construction of 21.1 miles of road and two new LTFs. Construction of LTFs at False Bay and Seal Creek has been completed. Timber volume from VCU 214 would go through the Seal Creek LTF. Volume from VCUs 215 and 218 would go through the existing LTF at Kennel Creek. Timber from VCUs 209, 210, and 212 may go through the new False Bay LTF or the existing Long Island LTF, depending on the timing.

For 1990, Alternative 1 includes the harvest of 27.3 MMBF on 1,133 acres from VCUs 204, 210, 212, 213, 214, 215, 217, 218, and 219. The 1990 season would also have 19.1 miles of road construction. The timber volume from each VCU would presumably move through the nearest LTF, but with the interconnected road system, any of the LTFs could be used.

## 2 Alternatives

Alternative 1 is evaluated as a basis for comparing the other alternatives with respect to the environmental consequences, the issues, the effectiveness in meeting Contract requirements, and the management objectives.

The objectives and guidelines (Forest Service 1983a) in effect for the 1986-90 Operating Period EIS would apply to those activities continuing under Court authorization. If implemented, Alternative 1 would:

- cease timber harvesting and road construction in Analysis Area 3 when activities currently authorized by the Settlement Agreements are completed, probably sometime during the 1990 operating season.
- use the existing log transfer facilities and logging camps at Long Island and Kennel Creek and the newly authorized LTFs at Seal Creek and False Bay until activities ceased.
- use existing roads and construct additional roads already approved in the settlement agreements.
- stop future land management activities until another Environmental Impact Statement and Record of Decision approved continuance of activities.

Table 2-1 presents the acres and volume of timber proposed for harvest in 1989 in Alternative 1. Table 2-2 presents the acres and volume of timber proposed for harvest in 1990 in Alternative 1. Virtually all of the harvest in 1989 would be by highlead harvest systems (Table 2-3). Table 2-4 presents a summary of the proposed harvest systems for 1990. The existing roads and harvest units and those continuing under Court authorization are shown on the Alternative map folded in the back of this document.

*"Pond Monkey" Maneuvers Boom Logs Around Log Bundles to Form a Log Raft*



Table 2-1

**Proposed Timber Harvest by VCU, Harvest Unit, and Volume Class for Alternative 1 in 1989**

VCU	Harvest Unit	Volume (MBF)	Volume Class (Acres) <sup>1</sup>				Total Acres	Volume/Acre
			4	5	6	7		
209	26	512	32	0	0	0	32	16
	27 <sup>2</sup>	800	40	6	0	0	46	17
	27 <sup>3</sup>	666	30	7	0	0	37	18
	31	766	13	10	9	0	32	24
	32	895	21	21	0	0	42	21
	33	1,378	8	47	0	0	55	25
	34	320	20	0	0	0	20	16
VCU Total		5,337	164	91	9	0	264	20
210	2	1,750	0	0	54	0	54	32
	3	2,617	127	22	0	0	149	18
	4	2,265	110	19	0	0	129	18
	5	958	5	33	0	0	38	25
	6	2,362	136	7	0	0	143	17
	7	1,802	60	0	26	0	86	21
	8	3,300	15	21	41	26	103	32
	9	916	15	12	11	0	38	24
	10	2,507	9	45	36	0	90	28
	11	544	34	0	0	0	34	16
	14	3,091	12	109	0	0	121	26
	15	3,093	47	88	0	0	135	23
VCU Total		25,205	570	356	168	26	1,120	23
212	24	937	17	25	0	0	42	22
	25	3,857	0	145	0	0	145	27
	26 <sup>4</sup>	3,818	37	75	38	0	150	25
	27 <sup>4</sup>	904	0	34	0	0	34	27
	28 <sup>4</sup>	4,176	0	157	0	0	157	27
VCU Total		13,692	54	436	38	0	528	26

(Continued)

## 2 Alternatives

Table 2-1 (Continued)

### Proposed Timber Harvest by VCU, Harvest Unit, and Volume Class for Alternative 1 in 1989

VCU	Harvest Unit	Volume (MBF)	Volume Class (Acres) <sup>1</sup>			Total Acres	Volume/Acre
			4	5	6		
214	1 <sup>4</sup>	1,171	15	35	0	0	50
	20	1,373	11	45	0	0	56
	184	432	27	0	0	0	27
	185	1,288	24	34	0	0	58
	186 <sup>4</sup>	2,268	0	0	70	0	70
	188	1,342	44	24	0	0	68
	190 <sup>4</sup>	1,842	22	56	0	0	78
VCU Total		9,716	143	194	70	0	407
215	16	3,059	0	115	0	0	115
	149	836	9	26	0	0	35
	H17	1,087	48	12	0	0	60
	VCU Total	4,982	57	153	0	0	210
218	1	2,468	40	20	40	0	100
	80	669	0	2	19	0	21
	180	447	8	12	0	0	20
	182	213	10	2	0	0	12
	183	605	2	13	7	0	22
	VCU Total	4,402	60	49	66	0	175
Total for All VCUs		63,334	1,048	1,279	351	26	2,704
23							

SOURCE: SEIS Planning Record, Chatham Area Supervisor's Office, Sitka, AK.

<sup>1</sup> Volume Classes 1 through 3 (not presented) contain less than 8 MBF/acre; Volume Class 4 contains 8-20 MBF/acre; Volume Class 5 contains 20-30 MBF/acre; Volume Class 6 contains 30-50 MBF/acre; and Volume Class 7 contains 50 or more MBF/acre.

<sup>2</sup> Harvest unit from 1981-86 FEIS.

<sup>3</sup> Harvest unit from 1986-90 FEIS.

<sup>4</sup> Units projected remaining at time of ROD.

Table 2-2

**Proposed Timber Harvest by VCU, Harvest Unit, and Volume Class for Alternative 1 in 1990**

VCU	Harvest Unit	Volume (MBF)	4	Volume Class (Acres) <sup>1</sup>			Total Acres	Volume/Acre
				5	6	7		
204	95 <sup>2</sup>	485	7	14	0	0	21	23.1
	VCU Total	485	7	14	0	0	21	23.1
208	10	485	12	11	0	0	23	21.1
	11	336	21	0	0	0	21	16.0
	VCU Total	821	33	11	0	0	44	18.7
209	12	2,795	15	96	0	0	111	25.2
	25	848	43	6	0	0	49	17.3
	29	1,634	29	44	0	0	73	22.4
	30 <sup>3</sup>	688	43	0	0	0	43	16.0
	30 <sup>4</sup>	160	10	0	0	0	10	16.0
	VCU Total	6,125	140	146	0	0	286	21.4
210	16 <sup>2</sup>	842	0	28	3	0	31	27.2
	17 <sup>2</sup>	771	0	29	0	0	29	26.6
	18 <sup>2</sup>	614	0	17	5	0	22	27.9
	VCU Total	2,227	0	74	8	0	82	27.2
212	5 <sup>2</sup>	3,385	0	70	47	0	117	28.9
	6 <sup>2</sup>	1,378	8	47	0	0	55	25.1
	7 <sup>2</sup>	1,862	0	70	0	0	70	26.6
	8 <sup>2</sup>	2,067	61	41	0	0	102	20.3
	9 <sup>2</sup>	1,830	3	67	0	0	70	26.1
	10 <sup>2</sup>	2,889	11	102	0	0	113	25.6
	34 <sup>2</sup>	1,789	42	42	0	0	84	21.3
	VCU Total	15,200	125	439	47	0	611	24.9
213	7 <sup>2</sup>	720	45	0	0	0	45	16.0
	6 <sup>2</sup>	1,258	26	0	26	0	52	24.2
	D4 <sup>2</sup>	1,050	39	16	0	0	55	19.1
	D3 <sup>2</sup>	750	2	27	0	0	29	25.9
	VCU Total	3,778	112	43	26	0	181	20.9

(Continued)

## 2 Alternatives

Table 2-2 (Continued)

### Proposed Timber Harvest by VCU, Harvest Unit, and Volume Class for Alternative 1 in 1990

VCU	Harvest Unit	Volume (MBF)	Volume Class (Acres) <sup>1</sup>			Total Acres	Volume/Acre
			4	5	6		
214	2 <sup>2</sup>	857	2	31	0	0	33
	3 <sup>2</sup>	1,293	16	39	0	0	55
	10 <sup>2</sup>	474	8	13	0	0	21
	189	750	7	24	0	0	31
VCU Total		3,374	33	107	0	0	140
215	5	1,277	0	48	0	0	48
	6	1,037	0	39	0	0	39
	8	176	11	0	0	0	11
	159	709	31	8	0	0	39
	H12 <sup>2</sup>	1,474	9	50	0	0	59
	H13 <sup>2</sup>	911	22	21	0	0	43
VCU Total		5,584	73	166	0	0	239
217	3 <sup>2</sup>	1,129	34	22	0	0	56
	VCU Total		1,129	34	22	0	56
218	19 <sup>2</sup>	511	2	18	0	0	20
	76	436	4	14	0	0	18
	79	128	3	3	0	0	6
	81	273	4	3	4	0	11
	176	532	0	20	0	0	20
	177	170	4	4	0	0	8
	179	240	15	0	0	0	15
VCU Total		2,290	32	62	4	0	98
219	2 <sup>2</sup>	448	28	0	0	0	28
	3 <sup>2</sup>	1,156	49	14	0	0	63
	VCU Total		1,604	77	14	0	91
Total for all VCUs		42,617	666	1,098	85	0	1,849
23.0							

SOURCE: SEIS Planning Record, Chatham Area Supervisor's Office, Sitka, AK.

<sup>1</sup> Volume Classes 1 through 3 (not presented) contain less than 8 MBF/acre; Volume Class 4 contains 8-20 MBF/acre; Volume Class 5 contains 20-30 MBF acre; Volume Class 6 contains 30-50 MBF/acre; and Volume Class 7 contains 50 or more MBF/acre.

<sup>2</sup> Units projected remaining at time of ROD.

<sup>3</sup> Harvest unit from 1981-86 FEIS.

<sup>4</sup> Harvest unit from 1986-90 FEIS.

**Table 2-3**  
**Distribution of Proposed Harvest Systems for Alternative 1 in 1989**

Logging System	Harvested Acres	Total Acres Harvested (percent)	Volume Harvested (MBF)	Total Volume Harvested (percent)
Highlead	2,704	100	63,334	100
Short/Intermediate				
Span Skyline	0	0	0	0
Long Span Skyline	0	0	0	0
Helicopter	0	0	0	0
Total	2,704	100	63,334	100

SOURCE: SEIS Planning Record.

**Table 2-4**  
**Distribution of Proposed Harvest Systems for Alternative 1 in 1990**

Logging System	Harvested Acres	Total Acres Harvested (percent)	Volume Harvested (MBF)	Total Volume Harvested (percent)
Highlead	1,826	98.8	42,193	99.0
Short/Intermediate				
Span Skyline	23 <sup>1</sup>	1.2	424	1.0
Long Span Skyline	0	0	0	0
Helicopter	0	0	0	0
Total	1,849	100.0	42,617	100.0

SOURCE: SEIS Planning Record.

<sup>1</sup> These are unharvested 1981-86 skyline logging acres.

## 2 Alternatives

### Alternative 2 - No Further Harvest

Alternative 2, the "No Further Harvest" Alternative, assumes that the ROD will be signed about the end of the 1989 operating season. Alternative 2 includes all of the APC 1989 Operating Plan harvest units, LTFs, and roads. The proposed and existing harvest units and roads are displayed on the Alternative map folded into the back of this document.

*Alaska Marine Highway Ferry  
MV Le Conte, Links Hoonah  
to Other Southeast Alaska  
Communities*



## Alternative 3

Alternative 3 is patterned after 1986-90 Alternative J as modified by the Record of Decision. Alternative 3 proposes the harvest of about 76 MMBF on 3,285 acres in addition to the harvest in Alternative 1. It emphasizes economic returns to the purchaser. Of the 76 MMBF to be harvested, 47 million would be harvested from court-deferred VCUs 203 and 204 and 17 million would be from the *Hanlon v. Barton* deferred units in VCUs 208, 209, 210, and 212. To minimize road construction and concentrate harvest in the Freshwater Bay area, an additional 15 MMBF would be harvested from nondeferred VCUs 217 and 218. This would provide enough volume for an additional operating season at the Kennel Creek camp to carry it through December 31, 1990. The average clearcut size would be 66 acres. This alternative does not include harvest unit 16 in VCU 204 or units 17 or 18 in VCU 216, which were deferred in the *Tenakee Springs v. Courtright* Settlement Agreement.

Thirty-two miles of road construction would access 51 harvest units for an average of 2.4 MMBF/mile of road. A road that could connect the Tenakee Springs and Hoonah road systems would not be built. Thirteen percent of the volume (10 MMBF) would be harvested by skyline systems under this Alternative. VCUs 203, 204, 208, 209, 210, and 212 would use the Long Island LTF, and VCUs 217 and 218 would use the Kennel Creek LTF. An environmental assessment has been approved to construct a temporary log transfer facility at False Bay. If this facility is constructed, some volume from VCUs 208, 209, 210, and 212 could be transferred at this location, which would shorten the haul distance for these logs.

The acres and volume of timber harvest proposed in Alternative 3 are presented in Table 2-5. The proposed harvest systems are summarized in Table 2-6. The proposed and existing harvest units and roads are displayed on the Alternative map folded into the back of this document.

*Whitestone Harbor*



Table 2-5

## Proposed Timber Harvest by VCU, Harvest Unit, and Volume Class for Alternative 3

VCU	Harvest Unit	Volume (MBF)	Volume Class (Acres) <sup>1</sup>				Total Acres	Volume/Acre
			4	5	6	7		
203	126	3,060.0	25	100	0	0	125	24.5
	127	4,186.6	14	43	87	0	144	29.1
	128	2,943.2	31	92	0	0	123	23.9
	129	3,576.2	29	117	0	0	146	24.5
	130	883.0	2	32	0	0	34	26.2
	131	2,544.0	21	83	0	0	104	24.5
	132	1,303.0	0	49	0	0	49	26.6
VCU Total		18,874.2	124	529	87	0	725	25.5
204	86	1,768.4	54	34	0	0	88	20.1
	88	1,056.0	66	0	0	0	66	16.0
	90	1,383.0	0	52	0	0	52	26.6
	91	816.0	51	0	0	0	51	16.0
	92	1,056.0	66	0	0	0	66	16.0
	93	656.0	41	0	0	0	41	16.0
	99	245.0	7	5	0	0	12	20.4
	121	1,051.2	9	0	28	0	37	28.4
	122	469.6	0	14	3	0	17	27.6
	123	862.2	9	27	0	0	36	24.0
	124	2,905.0	71	19	39	0	129	22.5
	125	451.2	12	0	8	0	20	22.6
	133	3,028.0	42	24	53	0	119	25.5
	134	3,387.6	24	24	73	0	121	28.0
	135	2,888.2	36	65	18	0	119	24.3
	157	1,198.8	0	0	37	0	37	32.4
	197	1,394.8	24	38	0	0	62	22.5
	198	245.0	7	5	0	0	12	20.4
VCU Total		24,662.0	519	307	259	0	1,065	23.2
208	3	607.0	13	15	0	0	28	16.0
	4 <sup>2</sup>	576.0	36	0	0	0	36	30.7
	4 <sup>3</sup>	352.0	22	0	0	0	22	16.0
VCU Total		1,535.0	71	15	0	0	86	17.8
209	17	1,072.0	0	33	6	0	39	24.8
	21	272.0	17	0	0	0	17	16.0
	22	512.0	22	6	0	0	28	18.3
VCU Total		1,856.0	39	39	6	0	84	22.1

(Continued)

Table 2-5 (Continued)

## Proposed Timber Harvest by VCU, Harvest Unit, and Volume Class for Alternative 3

VCU	Harvest Unit	Volume (MBF)	Volume Class (Acres) <sup>1</sup>				Total Acres	Volume/Acre
			4	5	6	7		
210	1	1,986.0	41	50	0	0	91	21.8
	12	3,466.0	62	93	0	0	155	22.4
	13	917.0	39	11	0	0	50	18.3
VCU Total		6,369.0	142	154	0	0	296	21.5
212	3	581.0	33	2	0	0	35	16.6
	4	1,938.0	30	0	45	0	75	25.8
	23	1,754.0	17	35	17	0	69	25.4
	33	866.0	15	15	7	0	37	23.5
	D12	522.0	5	2	12	0	19	27.5
	D13	1,666.0	21	70	0	0	69	24.2
	D14	570.0	11	21	0	0	25	23.0
VCU Total		7,896.0	133	146	82	0	329	24.0
217	42	2,144.8	0	38	35	0	73	29.4
	56	1,944.0	0	0	60	0	60	32.4
	VCU Total		4,088.8	0	38	95	0	133
218	21	1,303.4	0	49	0	0	49	26.6
	22	478.8	0	18	0	0	18	26.6
	24	2,340.8	0	88	0	0	88	26.6
	29	944.0	59	0	0	0	59	16.0
	33	1,945.6	0	50	19	0	69	28.2
	34	1,344.0	84	0	0	0	84	16.0
	35	1,280.0	80	0	0	0	80	16.0
	106	1,600.0	100	0	0	0	100	16.0
VCU Total		11,236.6	323	205	19	0	547	20.5
Total for all VCUs		76,339.0	1,341	1,397	547	0	3,285	23.2

SOURCE: SEIS Planning Record, Chatham Area Supervisor's Office, Sitka, AK.

<sup>1</sup> Volume Classes 1 through 3 (not presented) contain less than 8 MBF/acre; Volume Class 4 contains 8-20 MBF/acre; Volume Class 5 contains 20-30 MBF/acre; Volume Class 6 contains 30-50 MBF/acre; and Volume Class 7 contains 50 or more MBF/acre.<sup>2</sup> Harvest unit from 1981-86 FEIS.<sup>3</sup> Harvest unit from 1986-90 FEIS.

## 2 Alternatives

Table 2-6  
**Distribution of Proposed Harvest Systems for Alternative 3**

Logging System	Harvested Acres	Total Acres Harvested (percent)	Volume Harvested (MBF)	Total Volume Harvested (percent)
Highlead	2,817	86	66,180	87
Short/Intermediate				
Span Skyline <sup>1</sup>	468	14	10,159	13.0
Long Span Skyline	0	0	0	0
Helicopter	0	0	0	0
<b>Total</b>	<b>3,285</b>	<b>100</b>	<b>76,339</b>	<b>100</b>

SOURCE: SEIS Planning Record.

<sup>1</sup> Includes 308 acres of unharvested 1981-86 skyline logging.



## Alternative 4

Alternative 4 would replace volume from deferred VCUs with volume from nondeferred VCUs. This alternative would further defer harvest in unentered portions of VCUs 203, 204, and 216 (on National Forest land). Harvest would be scheduled in the previously entered VCUs 209, 210, 212, 213, 215, 217, 218, and 219. Harvest would also be scheduled in previously unentered VCU 211.

In addition to the volume from Alternative 1, 55 million board feet would be harvested by Alternative 4, requiring 33 miles of road construction for an average of 1.6 MMBF/mile of road construction. Forty-one harvest units are planned in the 9 VCUs. Approximately 18 MMBF are planned for harvest by skyline system, and the remainder would be by highlead. The Long Island LTF or the False Bay LTF would transfer volume from VCUs 209, 210, 211, 212, and 213. The Kennel Creek LTF would transfer volume from VCUs 215, 217, 218, and 219.

The acres and volume of timber harvest proposed in Alternative 4 are presented in Table 2-7. The proposed harvest systems are summarized in Table 2-8. The proposed and existing harvest units and roads are displayed on the Alternative map folded into the back of this document.

*Recent Timber Harvest Near Freshwater Bay*



## 2 Alternatives

Table 2-7

### Proposed Timber Harvest by VCU, Harvest Unit, and Volume Class for Alternative 4

VCU	Harvest Unit	Volume (MBF)	4	Volume Class (Acres) <sup>1</sup>			Total Acres	Volume/Acre
				5	6	7		
209	11	800.0	50	0	0	0	50	16.0
	13	744.8	0	28	0	0	28	26.6
	14	688.0	43	0	0	0	43	16.0
	16	931.0	0	35	0	0	35	26.6
	17	665.0	0	25	0	0	25	26.6
VCU Total		3,828.8	93	88	0	0	181	21.2
210	6	1,120.0	70	0	0	0	70	16.0
	7	1,440.0	90	0	0	0	90	16.0
	8	2,926.0	0	110	0	0	110	26.6
	9	1,491.0	35	35	0	0	70	21.3
	10	1,312.0	82	0	0	0	82	16.0
	50	1,248.0	78	0	0	0	78	16.0
VCU Total		9,537.0	355	145	0	0	500	19.1
211	1	688.0	43	0	0	0	43	16.0
	2	1,596.0	0	60	0	0	60	26.6
	4	1,280.0	80	0	0	0	80	16.0
	5	1,675.8	0	63	0	0	63	26.6
VCU Total		5,239.8	123	123	0	0	246	21.3
212	54	1,600.0	100	0	0	0	100	16.0
VCU Total		1,600.0	100	0	0	0	100	16.0
213	44	3,402.0	0	0	105	0	105	32.4
	55	1,161.6	24	0	24	0	48	24.2
	VCU Total		4,563.6	24	0	129	0	153
215	60	2,376.0	25	0	61	0	86	27.7
	63	798.0	0	30	0	0	30	26.6
	64	931.0	0	35	0	0	35	26.6
	65	1,231.2	0	0	38	0	38	32.4
	66	880.0	55	0	0	0	55	16.0
	67	1,440.0	90	0	0	0	90	16.0
	180	1,592.2	38	37	0	0	75	21.2
VCU Total		9,249.0	201	102	83	0	409	22.6

(Continued)

Table 2-7 (Continued)

**Proposed Timber Harvest by VCU, Harvest Unit, and Volume Class for Alternative 4**

VCU	Harvest Unit	Volume (MBF)	Volume Class (Acres) <sup>1</sup>			Total Acres	Volume/Acre
			4	5	6		
217	42	2,144.8	0	38	35	0	73
	56	1,944.0	0	0	60	0	60
VCU Total		4,088.8	0	38	95	0	133
218	21	1,303.4	0	49	0	0	49
	22	478.8	0	18	0	0	18
	23	1,010.8	0	38	0	0	38
	24	2,340.8	0	88	0	0	88
	25	1,170.4	0	44	0	0	44
	28	592.0	37	0	0	0	37
	29	944.0	59	0	0	0	59
	31	1,303.4	0	49	0	0	49
	33	1,945.6	0	50	19	0	69
	34	1,344.0	84	0	0	0	84
	35	1,280.0	80	0	0	0	80
	106	1,600.0	100	0	0	0	100
VCU Total		15,313.2	360	336	19	0	715
219	36	960.0	60	0	0	0	60
	39	665.0	0	25	0	0	25
VCU Total		1,625.0	60	25	0	0	85
Totals for all VCUs		55,045.0	1,323	857	342	0	2,522
							21.8

SOURCE: SEIS Planning Record, Chatham Area Supervisor's Office, Sitka, AK.

<sup>1</sup> Volume Classes 1 through 3 (not presented) contain less than 8 MBF/acre; Volume Class 4 contains 8-20 MBF/acre; Volume Class 5 contains 20-30 MBF/acre; Volume Class 6 contains 30-50 MBF/acre; and Volume Class 7 contains 50 or more MBF/acre.

**Table 2-8**  
**Distribution of Proposed Harvest Systems for Alternative 4**

Logging System	Harvested Acres	Total Acres Harvested (percent)	Volume Harvested (MBF)	Total Volume Harvested (percent)
Highlead	1,737.3	68.9	36,490.0	65.9
Short/Intermediate				
Span Skyline	784.7	31.1	18,555.4	34.1
Long Span Skyline	0	0	0	0
Helicopter	0	0	0	0
Total	2,522.0	100.0	55,045.0	100.0

SOURCE: SEIS Planning Record.

## 2 Alternatives

### Alternative 5

This alternative proposes to enter court-deferred VCU 204 but defers entry into VCU 203. Harvest units in nondeferred VCUs 209, 210, 212, 213, 215, 217, 218, and 219 were redesigned or moved to minimize impacts on wildlife and fish habitat.

In addition to the harvest volume of Alternative 1, Alternative 5 proposes harvest of 53.5 million board feet on 2,419 acres. Thirty-six miles of road would be constructed for an average of 1.5 MMBF/mile of road construction. About 18 million board feet would be harvested in VCU 204 and 36 MMBF from the non-deferred VCUs. Twenty-four million board feet would be harvested by skyline system and the remainder by highlead. The Long Island, Kennel Creek, and False Bay log transfer facilities would be used.

The acres and volume of timber harvest proposed in Alternative 4 are presented in Table 2-9. The proposed harvest systems are summarized in Table 2-10. The proposed and existing harvest units and roads are displayed on the Alternative map folded into the back of this document.

Table 2-9

## Proposed Timber Harvest by VCU, Harvest Unit, and Volume Class for Alternative 5

VCU	Harvest Unit	Volume (MBF)	Volume Class (Acres) <sup>1</sup>				Total Acres	Volume/Acre
			4	5	6	7		
204	86	1,768.4	54	34	0	0	88	20.1
	88	1,056.0	66	0	0	0	66	16.0
	89	2,207.8	0	83	0	0	83	26.6
	90	1,383.0	0	52	0	0	52	26.6
	91	816.0	51	0	0	0	51	16.0
	92	1,056.0	66	0	0	0	66	16.0
	93	656.0	41	0	0	0	41	16.0
	94	1,162.6	0	23	17	0	40	29.1
	95	2,475.6	0	48	37	0	85	29.1
	96	1,525.8	0	33	20	0	53	28.8
	97	2,534.6	0	49	38	0	87	29.1
	98	1,236.6	0	27	16	0	43	28.8
VCU Total		17,897.0	278	349	128	0	755	23.7
209	11	800.0	50	0	0	0	50	16.0
	13	744.8	0	28	0	0	28	26.6
	14	688.0	43	0	0	0	43	16.0
	16	931.0	0	35	0	0	35	26.6
	17	665.0	0	25	0	0	25	26.6
VCU Total		3,828.8	93	88	0	0	181	21.2
210	6	1,120.0	70	0	0	0	70	16.0
	7	1,440.0	90	0	0	0	90	16.0
	8	2,926.0	0	110	0	0	110	26.6
	50	1,248.0	78	0	0	0	78	16.0
VCU Total		6,734.0	238	110	0	0	348	19.4
212	54	1,600.0	100	0	0	0	100	16.0
VCU Total		1,600.0	100	0	0	0	100	16.0
213	44	3,402.0	0	0	105	0	105	32.4
	55	1,161.6	24	0	24	0	48	24.2
VCU Total		4,563.6	24	0	129	0	153	29.8

(Continued)

## 2 Alternatives

Table 2-9 (Continued)

### Proposed Timber Harvest by VCU, Harvest Unit, and Volume Class for Alternative 5

VCU	Harvest Unit	Volume (MBF)	Volume Class (Acres) <sup>1</sup>				Total Acres	Volume/Acre
			4	5	6	7		
215	63	798.0	0	30	0	0	30	26.6
	64	931.0	0	35	0	0	35	26.6
	65	1,231.2	0	0	38	0	38	32.4
	66	880.0	55	0	0	0	55	16.0
	67	1,440.0	90	0	0	0	90	16.0
	180	1,592.2	38	37	0	0	75	21.2
VCU Total		6,872.4	183	102	38	0	323	21.3
217	56	1,944.0	0	0	60	0	60	32.4
VCU Total		1,944.0	0	0	60	0	60	32.4
218	23	1,010.8	0	38	0	0	38	26.6
	24	2,340.8	0	88	0	0	88	26.6
	29	944.0	59	0	0	0	59	16.0
	31	1,303.4	0	49	0	0	49	26.6
	35	1,280.0	80	0	0	0	80	16.0
	106	1,600.0	100	0	0	0	100	16.0
VCU Total		8,479.0	239	175	0	0	414	20.5
219	36	960.0	60	0	0	0	60	16.0
	39	665.0	0	25	0	0	25	26.6
VCU Total		1,625.0	60	25	0	0	85	19.1
Total for all VCUs		53,525.0	1,215	849	355	0	2,419	22.1

SOURCE: SEIS Planning Record, Chatham Area Supervisor's Office, Sitka, AK.

<sup>1</sup> Volume Classes 1 through 3 (not presented) contain less than 8 MBF/acre; Volume Class 4 contains 8-20 MBF/acre; Volume Class 5 contains 20-30 MBF/acre; Volume Class 6 contains 30-50 MBF/acre; and Volume Class 7 contains 50 or more MBF/acre.

Table 2-10

**Distribution of Proposed Harvest Systems for Alternative 5**

<b>Logging System</b>	<b>Harvested Acres</b>	<b>Total Acres Harvested (percent)</b>	<b>Volume Harvested (MBF)</b>	<b>Total Volume Harvested (percent)</b>
Highlead	1,359	57	29,655	55
Short/Intermediate				
Span Skyline <sup>1</sup>	1,060	43	23,870	45
Long Span Skyline	0	0	0	0
Helicopter	0	0	0	0
<b>Total</b>	<b>2,419</b>	<b>100</b>	<b>53,525</b>	<b>100</b>

SOURCE: SEIS Planning Record.

<sup>1</sup> Includes 465 acres of unharvested 1981-86 skyline logging.

## 2 Alternatives

### Alternative 6

Alternative 6 emphasizes economic return to the purchaser and highlead logging systems to reduce logging costs. This alternative proposes to redesign the 1981-86 and 1986-90 skyline units in the Game Creek drainage (VCU 204) to allow for highlead logging. Additional units would be located in VCUs 210, 211, 213, 217, and 219.

In addition to the volume from Alternative 1, 36 MMBF would be harvested on 1,477 acres by Alternative 6, 17 million of which would be harvested from VCU 204. Twenty miles of road construction would be required, giving an average of 1.8 MMBF/mile of road construction. All units would be highlead logged. The Long Island LTF would be used for the timber from VCU 204 and either Long Island or False Bay LTF for VCUs 210 and 211. Timber from VCU 213 would be transferred through Seal Creek. VCUs 217 and 219 would use the Kennel Creek LTF.

Table 2-11 presents the acres and volume of proposed timber harvest. The proposed harvest systems are summarized in Table 2-12. The proposed and existing harvest units and roads are displayed on the Alternative map folded into the back of this document.

*Lower Game Creek Near the Boundary Between National Forest and Sealaska Corporation Lands*



Table 2-11

**Proposed Timber Harvest by VCU, Harvest Unit, and Volume Class for Alternative 6**

VCU	Harvest Unit	Volume (MBF)	Volume Class (Acres) <sup>1</sup>			Total Acres	Volume/Acre
			4	5	6		
204	121	1,051.2	9	0	28	0	37
	122	469.6	0	14	3	0	27.6
	137	2,698.8	39	78	0	0	117
	138	3,018.2	44	87	0	0	23.0
	139	1,104.0	69	0	0	0	16.0
	140	1,440.0	90	0	0	0	16.0
	141	2,652.9	0	0	61	15	76
	142	2,300.4	0	0	71	0	71
	143	879.4	40	9	0	0	17.9
	157	1,198.8	0	0	37	0	32.4
VCU Total		16,813.3	291	188	200	15	694
							24.2
210	6	1,120.0	70	0	0	0	70
	8	2,926.0	0	110	0	0	110
	151	2,261.0	0	85	0	0	85
	156	1,463.0	0	55	0	0	55
VCU Total		7,770.0	70	250	0	0	320
							24.3
211	150	2,314.2	0	87	0	0	87
VCU Total		2,314.2	0	87	0	0	87
213	152	2,834.0	0	70	30	0	100
	153	2340.8	0	88	0	0	88
VCU Total		5,174.8	0	158	30	0	188
							27.5
217	42	2,144.8	0	38	35	0	73
VCU Total		2,144.8	0	38	35	0	73
219	154	1,172.0	40	20	0	0	60
	155	880.0	55	0	0	0	55
VCU Total		2,052.0	95	20	0	0	115
							17.8
Total for all VCUs		36,269.1	456	741	265	15	1,477
							24.6

SOURCE: SEIS Planning Record, Chatham Area Supervisor's Office, Sitka, AK.

<sup>1</sup> Volume Classes 1 through 3 (not presented) contain less than 8 MBF/acre; Volume Class 4 contains 8-20 MBF/acre; Volume Class 5 contains 20-30 MBF/acre; Volume Class 6 contains 30-50 MBF/acre; and Volume Class 7 contains 50 or more MBF/acre.

## 2 Alternatives

Table 2-12  
**Distribution of Proposed Harvest Systems for Alternative 6**

Logging System	Harvested Acres	Total Acres Harvested (percent)	Volume Harvested (MBF)	Total Volume Harvested (percent)
Highlead	1,477.0	100	36,269.1	100
Short/Intermediate				
Span Skyline	0	0	0	0
Long Span Skyline	0	0	0	0
Helicopter	0	0	0	0
Total	1,477.0	100	36,269.1	100

SOURCE: SEIS Planning Record.

## Comparison of Alternatives

The comparison of alternatives draws together the conclusions from the materials presented throughout the document and summarizes the results of the analysis. It also presents the rationale leading to the identification of the preferred alternative. The following sections first compare the environmental impacts of the alternatives on the basis of the detailed analysis given in Chapter 4. The discussion next focuses on the issues, presenting a perspective on their perceived importance; it also compares the alternatives on the basis of management opportunities where they may differ in some enhancement of present or future amenities, resource production capabilities, or usability of resources. The discussion continues by comparing the economic aspects of the alternatives including both their direct and indirect costs and benefits. The discussion ends by comparing effectiveness of the alternatives in meeting the management direction of the Tongass Land Management Plan and the contract requirements of the APC Long-Term Timber Sale Contract.

### Impact Comparison

*Logs are Branded to Identify Where They Came From*

Table 2-13, Comparison of Environmental Impacts, provides a summary comparison of the impacts anticipated from each of the alternatives. This table summarizes information found in Chapter 4, Environmental Consequences. Figure 2-1 shows a comparison of road construction for all alternatives as a basis for understanding some of the comparisons in Table 2-13. The first part of Chapter 2 above presents a description of each alternative, while the analyses in Chapter 4 provide more detailed information and analysis of the impacts of the alternatives.



## 2 Alternatives

Table 2-13  
Summary Comparison of Alternatives

	Alternative 1 No Action/Current Direction	Alternative 2 No Further Harvest
Soils	No units or roads would be located on extreme hazard soils. This greatly reduces the potential to adversely impact soil productivity, mass wasting, and soil loss.	
Vegetation	Tree and understory species composition would be slightly altered on 4,553 acres. Pre-commercial thinning would be scheduled to accelerate both understory and conifer growth rates.	Tree and understory species composition would be slightly altered on 2,704 acres. Pre-commercial thinning would be scheduled to accelerate both understory and conifer growth rates.
Wildlife		
<i>Beach Fringe</i>	84 acres of beach fringe impacted. Beach fringe remaining would be 93 percent.	20 acres of beach fringe impacted. Beach fringe remaining would be about the same as under Alternative 1.
<i>Estuarine Fringe</i>	Estuarine fringe would not be impacted.	
<i>Eagle Sites</i>	No known eagle nest sites would be impacted.	No known eagle nest sites would be impacted.
<i>Deer Winter Range</i>	Approximately 335 acres or 89 percent of existing deer winter range (DWR) remaining. This is within TLMP Guidelines of 4 percent LUD III and 5 percent LUD IV.	Approximately 87 acres or 91 percent of existing deer winter range (DWR) remaining. This is within TLMP Guidelines.
<i>Inland Wetlands</i>	Inland wetlands would not be impacted.	
<i>Streamside/Riparian</i>	Total of 179 acres or 91 percent of streamside/riparian acres remaining. TLMP calls for 20 percent in LUD III or 10 percent in LUD IV to be retained. Impacts are within TLMP Guidelines.	Total of 97 acres or 92 percent of streamside/riparian acres remaining. Impacts are within TLMP Guidelines.

(Table Continued)

**Alternative 3****Alternative 4****Alternative 5****Alternative 6**

Impacts would be the same for all action alternatives.

Tree and understory species composition would be slightly altered on 7,838 acres. Pre-commercial thinning would be scheduled to accelerate both understory and conifer growth rates.

Tree and understory species composition would be slightly altered on 7,075 acres. Pre-commercial thinning would be scheduled to accelerate both understory and conifer growth rates.

Tree and understory species composition would be slightly altered on 6,972 acres. Pre-commercial thinning would be scheduled to accelerate both understory and conifer growth rates.

Tree and understory species composition would be slightly altered on 6,030 acres. Pre-commercial thinning would be scheduled to accelerate both understory and conifer growth rates.

107 acres of beach fringe impacted. Beach fringe remaining would be 92 percent.

84 acres of beach fringe impacted. Beach fringe remaining would be 93 percent.

84 acres of beach fringe impacted. Beach fringe remaining would be 93 percent.

317 acres of beach fringe impacted. Beach fringe remaining would be 89 percent.

Estuarine fringe would not be further impacted by any of the alternatives.

No known eagle nest sites would be impacted by any of the alternatives.

Approximately 591 acres or 88 percent of existing deer winter range (DWR) remaining. This is within TLMP Guidelines.

Approximately 389 acres or 89 percent of existing deer winter range (DWR) remaining. This is within TLMP Guidelines.

Approximately 433 acres or 88 percent of existing deer winter range (DWR) remaining. This is within TLMP Guidelines.

Greatest impact on DWR. Approximately 816 acres or 86 percent of existing deer winter range (DWR) remaining. This is within TLMP Guidelines.

Inland wetlands would not be impacted.

Total of 192 acres or 90 percent of streamside/riparian acres remaining. Impacts are within TLMP Guidelines.

Total of 182 acres or 91 percent of streamside/riparian acres remaining. Impacts are within TLMP Guidelines.

Total of 192 acres or 90 percent of streamside/riparian acres remaining. Impacts are within TLMP Guidelines.

Total of 216 acres or 90 percent of streamside/riparian acres remaining. Impacts are within TLMP Guidelines.

(Table Continued)

## 2 Alternatives

Table 2-13 (Continued)

### Summary Comparison of Alternatives

	Alternative 1 No Action/Current Direction	Alternative 2 No Further Harvest
<b>Fish Habitat</b>		
<i>Aquatic Habitat Management Units</i>	Potentially harvests 4.4 percent of Class I or 2.5 percent of Class II habitat in AHMU to one side of creek, and 2.6 percent of Class I and 1.9 percent of Class II to both sides of creek.	Potentially harvests 2.3 percent of Class I or 1.7 percent of Class II habitat in AHMU to one side of creek, and .9 percent of Class I and 1.5 percent of Class II to both sides of creek.
<i>Roads and Crossings</i>	About 1.4 miles of road would require AHMU protection measures.	About .3 miles of road would require AHMU protection measures.
<i>Stream Flow</i>		Little potential for change in stream flows.
<i>Sediment</i>		Application of standards and guidelines is expected to minimize impacts to soils.
<b>Marine Environment</b>		
	Low potential for impacting marine fisheries outside the sill. Little impact on salmon or herring or crab.	
<b>Land Status</b>	No change	No change
<b>Recreation</b>		AA3 would shift from semi-primitive nonmotorized to roaded natural or roaded modified in VCUs where harvest activities are taking place.
<b>Visual</b>	Eleven VCUs would be entered and eight meet assigned VQOs. VCUs 209, 218, and 219 would not fully meet the assigned VQOs.	Six VCUs would be entered and four meet assigned VQOs. VCUs 209 and 218 would not fully meet the assigned VQOs.
<b>Cultural Resources</b>		No impact to known cultural resources.
<b>Socioeconomics</b>	Harvest volume would maintain 538 jobs and \$12.5 million in salaries. 5 known outfitters use the area. No measurable change is expected in tourism under this alternative.	Harvest volume would maintain 363 jobs and \$8.4 million in salaries. No measurable change is expected in tourism under this alternative.

(Table Continued)

**Alternative 3****Alternative 4****Alternative 5****Alternative 6**

Potentially harvests 8.5 percent of Class I or 9.8 percent of Class II habitat in AHMU to one side of creek, and 8.8 percent of Class I and 6.5 percent of Class II to both sides of creek.

About 2.1 miles of road would require AHMU protection measures.

Potentially harvests 5.0 percent of Class I or 3.1 percent of Class II habitat in AHMU to one side of creek, and 2.5 percent of Class I and 1.9 percent of Class II to both sides of creek.

About 2.4 miles of road would require AHMU protection measures.

Potentially harvests 4.4 percent of Class I or 3.4 percent of Class II habitat in AHMU to one side of creek, and 2.9 percent of Class I and 1.9 percent of Class II to both sides of creek.

About 2.3 miles of road would require AHMU protection measures.

Potentially harvests 8.4 percent of Class I or 3.7 percent of Class II habitat in AHMU to one side of creek, and 2.9 percent of Class I and 2.3 percent of Class II to both sides of creek.

About 1.8 miles of road would require AHMU protection measures.

Little potential for change in stream flows.

Application of standards and guidelines is expected to minimize impacts to soils.

Low potential for impacting marine fisheries outside the sill. Little impact on salmon or herring or crab.

No further change

No further change

No further change

No further change

Analysis Area 3 would shift from semi-primitive nonmotorized to roaded natural or roaded modified in VCUs where harvest activities are taking place.

Eight VCUs would be entered and six meet assigned VQOs. VCUs 209 and 218 would not fully meet the assigned VQOs.

Nine VCUs would be entered and six meet assigned VQOs. VCUs 209, 218, and 219 would not fully meet the assigned VQOs.

Nine VCUs would be entered and six meet assigned VQOs. VCUs 209, 218, and 219 would not fully meet the assigned VQOs.

Six VCUs would be entered and four meet assigned VQOs. VCUs 213 and 219 would not fully meet the assigned VQOs.

No impact to known cultural resources.

Harvest volume would maintain 1032 jobs and \$23.9 million in salaries.

Harvest volume would maintain 825 jobs and \$19.2 million in salaries.

Harvest volume would maintain 824 jobs and \$19.1 million in salaries.

Harvest volume would maintain 672 jobs and \$15.6 million in salaries.

(Table Continued)

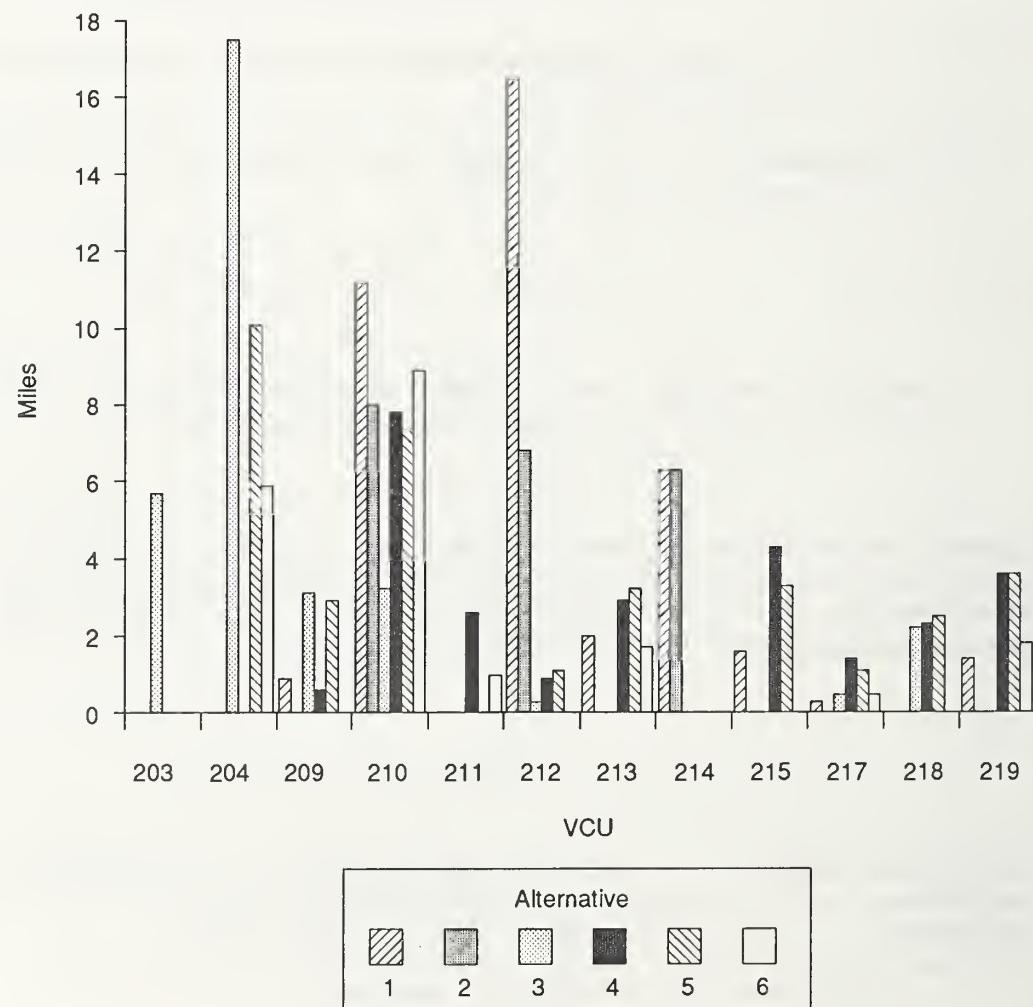
## 2 Alternatives

Table 2-13 (Continued)

### Summary Comparison of Alternatives

	Alternative 1 No Action/Current Direction	Alternative 2 No Further Harvest
Subsistence	Significant possibility of a significant restriction of subsistence use of wildlife.	
Timber/Firewood	Free use policies not affected.	
Reasonably Foreseeable, Long-Term, and Cumulative Effects	Minimal effects on all resources evaluated, except as described under subsistence.	

Figure 2-1  
**Road Construction Required for Each Alternative in Each VCU**



SOURCE: SEIS Planning Record.

**Alternative 3****Alternative 4****Alternative 5****Alternative 6**


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Significant possibility of a significant restriction of subsistence use of wildlife.

---

Free use policies not affected.

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Minimal effects on all resources evaluated, except as described under subsistence.

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**Issue Comparison**

Chapter 1 lists the issues that have driven the Phase I and Phase II SEIS analyses, as well as management opportunities and concerns. The following paragraphs compare the alternatives in terms of these issues and the management opportunities and concerns.

**Issue 1: Socioeconomic effects of timber harvesting and associated development**

Harvest of the APC long-term sale volume in Analysis Area 3 averaged 30 million board feet (MMBF) per year in 1987 and 1988. This harvest supported approximately 255 direct and indirect jobs per year. The baseline for the comparison of alternatives is the Current Direction - No Action Alternative, which in Analysis Area 3 is Alternative 1. This alternative would build on the existing socioeconomic base. The 1989 harvest season plan includes the harvest of 63.3 MMBF, which will support about 538 direct and indirect jobs. The 1990 harvest season plan would include harvest of 29.9 MMBF, enough to support about 254 direct and indirect jobs.

Alternative 2, the No Further Harvest Alternative, would provide the same 538 direct and indirect jobs as Alternative 1 in 1989, but none thereafter without further NEPA analysis. The socioeconomic effects after the end of the 1989 harvest season would be severe. The No Further Harvest Alternative could result in the government breaching the terms of the APC Long-Term Timber Sale Contract. Unilateral breach and possible termination of the long-term contracts would likely result in a large damage claim, which the Congressional Research Service estimates might be as high as \$53.7 million for the APC Contract.

Alternatives 3 through 6 would add additional volume to the 1990 volume of Alternative 1. Alternative 3 would provide the most volume (78.7 MMBF). This amount of volume would provide for approximately 672 additional direct and indirect jobs in 1990, or if one assumes that the same volume would be harvested in 1990 as in 1989, 58.1 MMBF would be carried over and would provide about 494 jobs in 1991. Alternative 4 would provide about 462 additional direct and indirect jobs in 1990 (or would carry over about 287 jobs to 1991 if the actual 1990 harvest was the same as the 1989 harvest). Alternative 5 would provide about 461 additional direct and indirect jobs in 1990 (or would carry over about 286 jobs as assumed above). Alternative 6, which provides the least volume, would provide for approximately 306 additional direct and indirect jobs in 1990 (or would carry over about 110 jobs as assumed above). Refer to the Economic Comparisons section for further discussion.

**Issue 2: Costs and benefits associated with implementing the alternatives.**

The No Action-Current Direction Alternative is the baseline for comparing the alternatives with respect to this issue. The cost per value analysis presented in the Economic Comparison below describes the dollar values maintained by each of the alternatives being evaluated. The

## 2 Alternatives

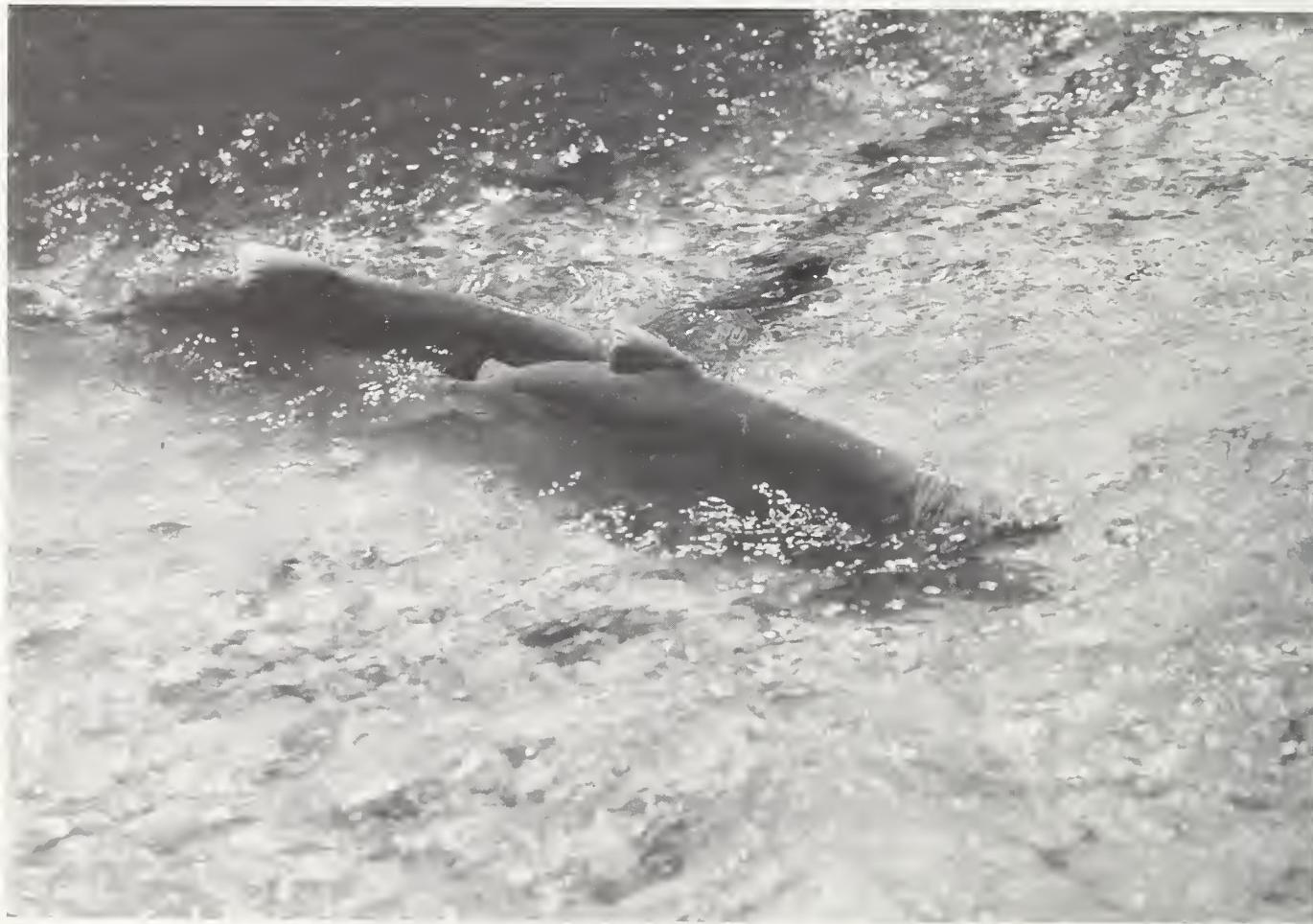
No Further Harvest Alternative could impact the cost of operation at the APC Pulp Mill if the Forest Service were unable to make up the additional volume in another area. A volume disruption of this magnitude could cause the pulp mill to experience temporary shutdowns. The cost of a temporary shutdown is estimated by APC to be \$500,000, plus \$4,800 for every day of shutdown (Appendix A-4, Draft SEIS).

### **Issue 3: Effects of timber harvest and related activities on fisheries habitat.**

The baseline for comparison of alternatives is the No Action-Current Direction Alternative. The assumptions made for the socioeconomic issue also pertain to the comparison of the effects of the proposed timber harvest alternatives on fisheries.

The evaluation of the proposed timber harvest alternatives for Analysis Area 3 presented in Chapter 4 indicates the potential effects on the fisheries resources evaluated are minimal and insignificant. The Alaska Region Aquatic Habitat Management Unit (AHMU) Guidelines were generally adopted in the development of the timber harvest alternatives in order to minimize the potential for impact to the valuable salmon and trout fisheries in Analysis Area 3. The adherence to the AHMU Guidelines in the formation of alternatives minimized the total stream bank miles affected, the number of stream crossings, and the amount of potential road construction within designated aquatic habitat management units. Site-specific prescriptions have been developed to minimize the potential for impact to the spawning and rearing habitat where it was necessary to encroach into an AHMU. The site-specific aquatic habitat management unit prescriptions are noted on the individual timber harvest Unit Cards, which are located in Appendix A-1.

*Spawning Salmon*



*Nesting Habitat***Issue 4: Effects of timber harvest and related activities on wildlife habitat.**

The baseline for comparison of alternatives is the No Action-Current Direction Alternative. The assumptions made for the socioeconomic issue also pertain to the following comparison of proposed timber harvest alternative effects on wildlife. Two points in time were used to evaluate the extent of potential wildlife effects. A point prior to timber harvesting in the area was used when comparing the percent reduction of habitat capability. A point in time after scheduled timber harvest in the SEIS was used to determine total impacts to emphasize habitat.

The evaluation presented in Chapter 4 and summarized here shows the potential effects on the wildlife resources evaluated to be minimal. Based on current habitat capability projections, Analysis Area 3 has the potential to support over 5,300 deer, 140 brown bears, and over 550 pine martens.

The potential reduction of habitat capability by the proposed timber harvest alternatives range from 81 to 190 deer, 6 to 14 brown bears, and 9 to 21 pine martens (Table 2-14). The potential percent reduction by alternative ranges from 1.4 to 3.3 percent for deer, 2.3 to 5.4 percent for brown bears, and 1.8 to 3.5 percent for pine martens (Table 2-14). The differences in habitat capability between the no-action and the action alternatives is so slight that it would be difficult to measure if an attempt was made to verify those differences in the field.

Table 2-15 displays the acres of inventoried wildlife habitat that would be affected by the proposed timber harvest alternatives and it displays the percent of unaffected wildlife habitat. Though the acres affected vary from alternative to alternative, the amount of acres affected with respect to the total inventoried emphasis species habitat acres is small.

The Record of Decision for the 1986-90 Operating Period EIS for the APC Long-Term Timber Sale prescribed approximately 88,500 acres to be managed in Old-Growth Habitat Condition for wildlife, of which 14,396 acres are in Analysis Area 3. The prescription was to remain in effect during the 1986-1990 operating period unless the stated management direction is modified after further NEPA analysis and public disclosure. The Supplement displays the

Table 2-14

**Projected Changes in Wildlife Habitat Capability Based on Models<sup>1</sup>**

	Alternative					
	1	2	3	4	5	6
<b>Deer Habitat Capability</b>						
Potential Reduction (individuals)	123	81	190	186	188	171
Potential Reduction (percent)	2.1	1.4	3.3	3.2	3.3	3.0
<b>Brown Bear Habitat Capability</b>						
Potential Reduction (individuals)	12	6	14	11	12	8
Potential Reduction (percent)	4.6	2.3	5.4	4.2	4.6	3.1
<b>Pine Marten Habitat Capability</b>						
Potential Reduction (individuals)	16	11	11	21	21	9
Potential Reduction (percent)	2.7	1.8	1.8	3.5	3.5	1.5

SOURCE: Forest Service in consultation with ADF&G (SEIS Planning Record) - See Consolidated Appendix, Volume II, C-3, theme response on data adequacy and models used.

<sup>1</sup> National Forest land.

## 2 Alternatives

effects on the Old Growth Habitat of new alternatives being considered in this NEPA assessment. Table 2-16 displays the range of acres that would be affected and the percent of Old-Growth Habitat Condition remaining by proposed timber harvest alternative.

Timber harvest effects shown for the emphasis species and emphasis habitats are indicative of the effects on other wildlife species and their habitats in Analysis Area 3.

### Issue 5: Distribution of harvest by volume class.

Table 2-17 summarizes the acres by volume class for each alternative being evaluated in this Supplement. Alternative 1, the No Action-Current Direction Alternative, provides the base line for comparing the other alternatives for this analysis area. Figure 2-2 shows a comparison of the cumulative amount of each timber volume class that would be harvested under each alternative.

None of the alternatives would harvest a significant amount of the high volume stands found in the analysis area, nor do they harvest a disproportionate percentage of high volume class stands.

Table 2-15  
**Changes in Wildlife Habitat Due to Timber Harvest<sup>1</sup>**

	Alternative					
	1	2	3	4	5	6
<b>Forested</b>						
Proposed Harvest (acres)	4,553	2,704	7,839	7,075	6,972	6,030
Percent Remaining	92	94	93	94	94	94
<b>Deer Winter Range</b>						
Proposed Harvest (acres)	335	87	256	210	98	426
Percent Remaining	89	91	90	90	90	88
<b>Inland Wetland</b>						
Proposed Harvest (acres)	0	0	0	0	0	0
Percent Remaining	90	90	90	90	90	90
<b>Beach Fringe</b>						
Proposed Harvest (acres)	89	20	23	0	0	223
Percent Remaining	92	93	93	94	94	90
<b>Estuarine Fringe</b>						
Proposed Harvest (acres)	0	0	0	0	0	0
Percent Remaining	98	98	98	98	98	98
<b>Streamside Riparian</b>						
Proposed Harvest (acres)	179	98	10	3	13	37
Percent Remaining	91	92	93	93	93	92

SOURCE: 1986-90 FEIS (Forest Service 1986b) and SEIS Planning Record.

<sup>1</sup> National Forest land.

Table 2-16

### Changes in Old-Growth Habitat Prescriptions Due to Timber Harvest<sup>1</sup>

	Alternative					
	1	2	3	4	5	6
<b>Old-Growth Conditions</b>						
Proposed Harvest (acres)	0	0	73	296	153	548
Percent Remaining	100	100	99	98	99	96

SOURCE: 1986-90 FEIS (Forest Service 1986b).

<sup>1</sup> National Forest land.

Table 2-17

### Acres Proposed for Harvest

Volume Class <sup>1</sup>	Alternative					
	1	2	3	4	5	6
4	1,714	1,048	1,341	1,323	1,215	456
5	2,377	1,279	1,397	857	849	741
6	436	351	547	342	355	265
7	26	26	0	0	0	15
Total	4,553	2,704	3,285	2,522	2,419	1,477

SOURCE: SEIS Planning Record, Chatham Area Supervisor's Office, Sitka, AK.

<sup>1</sup> Volume Classes 1 through 3 (not presented) contain less than 8 MBF/acre; Volume Class 4 contains 8-20 MBF/acre; Volume Class 5 contains 20-30 MBF/acre; Volume Class 6 contains 30-50 MBF/acre; and Volume Class 7 contains 50 or more MBF/acre.

### Issue 6: Log Transfer Facility (LTF) location and potential environmental effects.

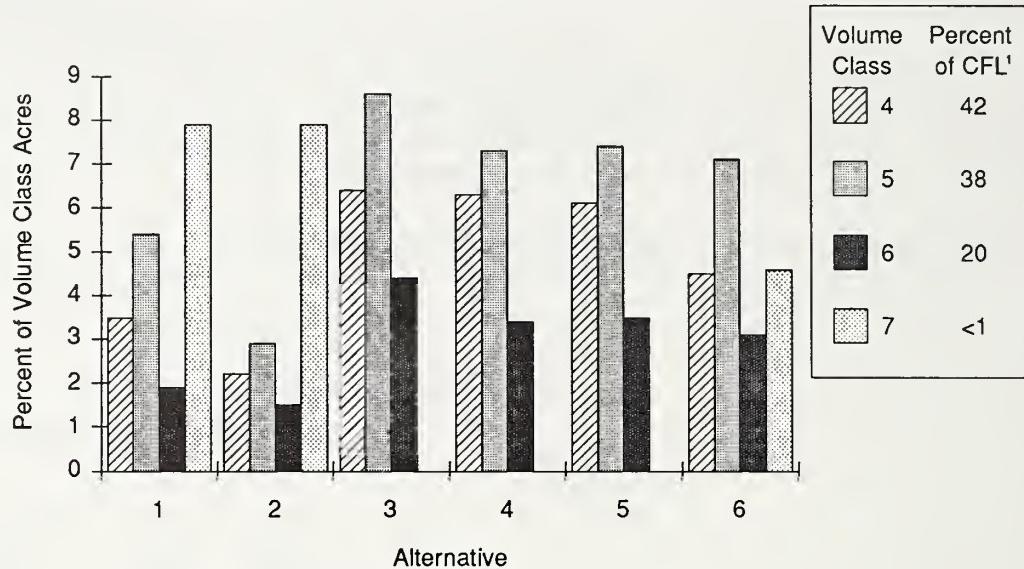
All alternatives propose to use LTFs with existing COE permits and State of Alaska tideland leases. All alternatives would use the LTFs at Kennel Creek and Long Island. Environmental analyses have been completed for two additional LTFs. These LTFs located at Seal Creek and False Bay have been constructed at the time of the FEIS. Alternative 1 will use the LTF at Seal Creek. All alternatives may use the LTF at False Bay.

### Issue 7: Effects on resource values of high-interest areas.

High-interest areas were defined based on the public response to the 1986-90 DEIS (p.1-20). In Analysis Area 3, Pavlof, VCU 218 was noted by ADF&G for its resident fisheries and wildlife values. Respondents also named Tenakee Inlet, Freshwater Bay Road, and Hoonah-Tenakee Tie Road as areas of concern.

All alternatives would harvest timber in VCU 218. All alternatives except Alternative 2 propose harvest in VCU 219, this is the only harvest proposed in the Tenakee Inlet area of Analysis Area 3.

Figure 2-2  
Cumulative Percentage of Volume Classes, Including Proposed for Harvest



SOURCE: Tongass Land Management Plan aerial photo points inventory, Forest Service Region 10, Juneau, AK.

<sup>1</sup> Value includes Volume Classes 4 through 7 only.

None of the alternatives propose connection of the Hoonah-Tenakee Tie Road. Alternatives 1, 2, and 4 would further defer entry into the Upper Game Creek portion of VCU 204. Alternative 3, which was patterned after the 1986-90 ROD was modified in VCUs 204 and 216 to defer 3 units, a stream crossing and a 2.7 mile road segment at the end of the Upper Game Creek Road.

#### Issue 8: Effects on visual, recreation, and wilderness resources.

Visual Resources: Of the 18 VCUs in Analysis Area 3, 11 would be entered by Alternative 1. Eight VCUs would meet the assigned VQOs and 3 would have portions that would not fully meet the assigned VQOs. VCUs 204, 208, 210, 212, 213, 214, 215, and 217 would fully meet the assigned VQOs. Under Alternative 1, portions of VCUs 209, 218, and 219 would not fully meet the assigned VQOs.

Alternative 2 would enter 6 VCUs in Analysis Area 3. Four VCUs would meet the assigned VQOs and 2 would have portions that would not fully meet the assigned VQOs. VCUs 210, 212, 214, and 215 would fully meet the assigned VQOs. In VCUs 209 and 218, the visual impacts would appear as moderate to major disturbances. In both VCUs, the impacts would be similar to Alternative 1.

Eight VCUs would be entered by Alternative 3. Of those 8, 6 VCUs would fully meet the assigned VQOs and 2 would not fully meet the assigned VQOs. VCUs 203, 204, 208, 210, 212, and 217 would fully meet the assigned VQOs. In VCUs 209 and 218 the visual impacts would appear as moderate disturbances.

A total of 9 VCUs would be entered in Alternative 4. Six VCUs would meet the assigned VQOs and 3 would have portions that would not fully meet the assigned VQOs. VCUs 210,

211, 212, 213, 215, and 217 would fully meet the assigned VQOs. Under Alternative 4, portions of 3 VCUs (209, 218, and 219) would not fully meet assigned VQOs.

As with Alternative 4, a total of 9 VCUs would be entered in Alternative 5. Six VCUs would meet the assigned VQOs and 3 would have portions that would not fully meet the assigned VQOs. VCUs 204, 210, 212, 213, 215, and 217 would fully meet the assigned VQOs. Under Alternative 5, portions of 3 VCUs (209, 218, and 219) would not fully meet assigned VQOs.

Alternative 6 would enter 6 VCUs. Of these 6 VCUs, 4 would meet the assigned VQOs and 2 would have portions that would not fully meet the assigned VQOs. VCUs 204, 210, 211, and 217 would fully meet the assigned VQO. Under Alternative 6, portions of 2 VCUs 213 and 219, would not fully meet assigned VQOs.

**Recreation Resources:** Alternative 2, the No Further Harvest Alternative, would result in the least impacts on recreation. Since Alternative 1 is added to all of the action alternatives its impacts on recreation, a change in recreation opportunity spectrum (ROS) of 28,629 acres in 10 VCUs, would be added to those displayed for Alternatives 3 through 6. Of the action alternatives, Alternative 6, because of its lower harvest level, would have the least impact on the Recreation Opportunity Spectrum. Under Alternative 2, the ROS designations would change on 3,618 acres in 7 VCUs. Alternative 3 would have the greatest impacts, affecting the ROS of 38,382 acres over 12 VCUs. Alternative 4 would affect 16,933 acres in ten VCUs, and Alternative 5 would effect 10,180 acres in 8 VCUs.

The above changes in ROS class are based on all roads in all alternatives remaining open. With road closures used as a mitigation measure, roaded recreation opportunities would decrease relative to the increase in miles of road closed. Alternative 2, having the lowest miles of road construction, would have the least number of miles of roaded recreation opportunities, whereas Alternative 3, which proposes the most miles of road construction has the highest number of roaded recreation opportunities. The converse is also true, in that Alternative 3 having the highest number of road miles would offer the least primitive recreation opportunities, and Alternative 2 would offer the most.

*Timber Harvest Effects on  
Private and National Forest  
Lands are Considered in the  
Analysis Process*



## 2 Alternatives

*Salmon are an Important Traditional Subsistence Resource*



### **Appeal Issue: Effects of proposed activities on subsistence uses**

Chapter 4 of the DSEIS evaluated the potential site-specific effects on subsistence use that could result from implementing any of the proposed timber harvest and associated road construction alternatives in Analysis Area 3. The Forest Service analysis indicated the implementation of Alternative 2 will have minor or no effects on the availability of subsistence resources. The analysis found the implementation of Alternatives 1, 3, 4, 5, and 6 could potentially affect key subsistence wildlife species in Analysis Area 3. The principal subsistence use areas that could be affected are Alaska Department of Fish and Game Minor Harvest Areas 3523, 3524, 3625, and 3626. The potential effect was projected to result from an increase in accessibility resulting from proposed road construction. Much of the potential effects on the subsistence wildlife species were projected to be offset by the road access management plan presented to mitigate the effects on brown bear. Still, the potential effects on key subsistence wildlife resources in Minor Harvest Areas 3523, 3524, 3625, and 3626 were projected to be enough to substantiate a finding in accordance with ANILCA Section 810 that the actions may restrict subsistence use.

The Forest Service held subsistence hearings in conformance with Section 810 of ANILCA following the release of this Draft SEIS. During the Tongass Resource Use Cooperative Survey, Hoonah and Tenakee Springs households expressed concerns about the potential effects to subsistence resources resulting from forestry management and fish and wildlife management activities on National Forest lands. The hearings gave Hoonah, Tenakee Springs, and other subsistence communities further opportunity to provide additional information concerning potential subsistence use impacts associated with the proposed timber harvest alternatives in Analysis Area 3. The comments received during the hearings were considered during the preparation of the Final Environmental Impact Statement for the Supplement.

The ANILCA Section 810 Subsistence Evaluation in Chapter 4 projects Analysis Area 3 alternatives, when combined with activities on adjacent private lands, could result in an immediate or reasonably foreseeable significant possibility of a significant restriction of subsistence use of wildlife, but not for fish and shellfish, or other food resources. (See Consolidated Appendix, Volume II, C-3, on data adequacy and models used). The evaluation further found that enough is known about foreseeable, programmatic Forest Service activities and other po-

tential foreseeable activities on private lands to project that the cumulative effects may possibly restrict subsistence uses.

**Management Concern (from 1986-90 FEIS): Use of nonstandard logging systems**  
 Timber harvest calculations in TLMP anticipated that a portion of the volume for APC would come from areas requiring use of nonstandard logging systems such as helicopters or long-span skylines (over 2,600 feet). Because the timber market reached a decade low, all of the 1986-90 alternative units were designed to use standard systems. None of the alternatives in this Supplement propose to use nonstandard systems.

**Management Concern (from the 1986-90 FEIS): Development of area-wide transportation system.**

**Management Opportunity (from the 1986-90 FEIS): Interconnect existing road systems.**

**Management Opportunity (from the 1986-90 FEIS): Reducing the administrative costs and risk to employees through increasing road access to work areas and by reducing the use of aircraft, specifically helicopters.**

These three concerns/opportunities are closely related. From the timber management perspective, increasing access to more areas disperses the impacts of timber harvesting. Reducing the use of aircraft would decrease the risk of loss of life for Forest Service and APC employees as well as reducing administrative costs.

**Current Management Concern:** The scope of activities proposed by the Supplemental EIS is constrained by a narrow time frame between the approval of the Record of Decision for this supplement and the end of the Operating Period.

The primary logistical problem is one of providing the balance of 1986-90 contractual volume while maximizing the potential for APC to log this volume during the balance of the Plan period. Volume not harvested by the end of the Operating Period will be available for transition into the 1991-95 Operating Period. Large amounts of road or other construction activities that need to be completed prior to making harvest units available reduce the potential of an alternative to respond to this concern.

**Management Opportunity (from the 1986-90 FEIS): Increase harvest unit size to optimum, consistent with Regional Guide Policy and protection of other resource values.**

The Regional Guide for Alaska requires that timber harvest units in Alaska not exceed 100 acres, unless exempted for specific reasons described in the Guide. All of the alternatives accomplish this. Protection of other forest resources may require units to be smaller than 100 acres. The average harvest unit size differs very little between the alternatives. They average from 57 acres for Alternative 1 to 74 acres for Alternatives 4 and 6. Units may exceed 100 acres in size due to transportation and harvest system requirements and a concern for blow-down hazards. In designing the action alternatives, the Tongass National Forest interdisciplinary team planned unit sizes to protect the most resources possible, thus accomplishing this management opportunity.

**Management Opportunity (from the 1986-90 FEIS): Maintenance of local economics.**  
 Please refer to the discussion of the socioeconomic issue above.

**Management Opportunity (from the 1986-90 FEIS): Increase the productivity of the timber resource.**

The depressed markets for lumber and pulp timber products of the early 1980s have been steadily rebounding. The opportunity now exists to increase the production of timber products to the levels anticipated by the TLMP schedule and as projected under the terms of ANILCA.

*A Forest Service Fisheries Biologist Evaluates Potential Effects to Salmon Spawning and Rearing Habitat*



## 2 Alternatives

*Log Scaler Determines the Board Feet in Each Log*



The action alternatives would place varying portions of the operable timber lands under intensive management, increasing the production of timber products for the remainder of this planning period (until December 31, 1990) and increasing the overall productivity for timber in the long term. The No Further Harvest Alternative, however, would not provide this management opportunity.

**Management Opportunity (from the 1986-90 FEIS): Maintain important fish and wildlife habitat.**

Please refer to the discussion of the fisheries habitat and wildlife habitat issues above.

**Management Opportunity (from the 1986-90 FEIS): Defer timber harvest and related activities in certain areas during the 1986-90 Operating Period.**

Please refer to the discussion of the high-interest areas above.

**Management Opportunity (from the 1986-90 FEIS): Make timber available to meet the Contract obligation.**

Please refer to the Effectiveness Comparison of the alternatives below.

### Economic Comparison

The economic consequences of the alternatives would differ. All alternatives would contribute volume toward the 4.5 billion board foot harvest level. The number of jobs and economic activity generated varies with the harvest level associated with each alternative.

Estimates of the number of jobs to be maintained varies from 7 to 11 jobs per million board feet. For the purposes of this analysis 8.5 jobs per MMBF<sup>1</sup> annually with an average value of \$23,200 per job is used (Forest Service 1989b). Based on this figure, the economic contribution toward maintenance of jobs is displayed in Table 2-18. None of the alternatives are expected to affect employment in either the commercial fishing or recreation/tourism related sectors of the economy.

The following comparison of alternatives used the Region 10 Timber Appraisal Handbook (Forest Service 1986a) with Base Year 1986 costs adjusted to the quarter ending in June 1988. Appraisal logging costs, transportation costs, and manufacturing costs were developed

Table 2-18

**Economic Contribution of Alternatives**

	1	2	3	4	5	6
<b>1989</b>						
Volume of Harvest (MMBF)	63.3	63.3	63.3	63.3	63.3	63.3
Jobs Maintained	538	538	538	538	538	538
Value from Wages (Million\$)	12.5	12.5	12.5	12.5	12.5	12.5
<b>1990</b>						
Volume of Harvest (MMBF)	29.9	0	121.4 <sup>1</sup>	97.1 <sup>1</sup>	96.9 <sup>1</sup>	79.0 <sup>1</sup>
Jobs Maintained	254	0	1,032	825	824	672
Value from Wages (Million\$)	8.4	0	23.9	19.2	19.1	15.6
Total Jobs Maintained <sup>2</sup>	254	0	1,395	1,188	1,187	1,035
Total Value from Wages <sup>2</sup>	8.4	0	32.3	27.6	27.5	24.0

SOURCE: Timber Supply and Demand, Draft 1988 Report (Forest Service 1989b).

<sup>1</sup> If the assumption is made that the same volume will be harvested in 1990 as in 1989 (63.3 MMBF), then the remaining volume would be carried over to 1991. In that case the jobs and wages should also be carried over. It would also be possible to harvest more in 1989.<sup>2</sup> The selected action alternative (3 through 6) would occur in addition to the no action/current direction alternative (1).

Table 2-19

**Costs to an Operator of Average Efficiency (Million \$)**

	Alternative					
	1	2 <sup>1</sup>	3	4	5	6
Logging Costs	14.2	8.5	10.6	8.1	8.0	5.1
Transportation Costs	11.1	6.5	9.6	7.4	8.5	5.4
Manufacturing Costs	30.5	18.2	22.7	15.7	15.6	10.4
Total	55.8	33.2	42.9	31.2	32.1	20.9
Total 1990 Costs <sup>2</sup>	22.6	0	65.5	53.8	54.7	43.5

SOURCE: Timber Supply and Demand, Draft 1988 Report (Forest Service 1989b).

<sup>1</sup> These costs apply to all the alternatives in 1989.<sup>2</sup> The costs of each action alternative are added to the cost of the 1990 harvest of the no action/current direction alternative because both would occur.

## 2 Alternatives

Table 2-20

### Values to an Operator of Average Efficiency (Million \$)

	Alternative					
	1	2 <sup>1</sup>	3	4	5	6
Timber Selling Values	47.0	16.2	34.7	24.0	13.9	9.3
Margin of Profit	7.0	2.4	5.2	3.6	2.1	1.4
Total	54.0	18.6	39.9	27.6	16.0	10.7
Total 1990 Values <sup>2</sup>	35.4	0	75.3	63.0	51.4	46.1

SOURCE: Timber Supply and Demand, Draft 1988 Report (Forest Service 1989b).

<sup>1</sup> These values apply to all the alternatives in 1989.

<sup>2</sup> The values for each action alternative are added to the value of the 1990 harvest for the no action/current direction alternative because both would occur.

for each alternative and are displayed below (Table 2-19). Also developed through the appraisal process are estimates of timber selling values and margin of profitability for the logger of average efficiency (Table 2-20).

- Comparison of Alternatives:

None of the alternatives provide an excess of value over cost, given the cost data used. Alternatives 3 and 4 would provide the maximum amount of volume harvested while minimizing costs. Alternatives 3 and 4 would also maintain the greatest number of jobs. The No Harvest Alternative would maintain 538 jobs through 1989 and none in the 1990 harvest season.

### Effectiveness Comparison

A brief analysis of alternatives based on their effectiveness in meeting nonresource oriented management objectives discussed earlier in this chapter revolved around the following three considerations:

- how well each alternative meets the intent of the Tongass Land Management Plan guidelines for a LUD III or LUD IV area,
- how well the alternative meets the range of volume projected in the Phase I SEIS to meet Alaska Pulp Corporation contractual obligations,
- how likely the alternative is to be implementable in terms of public controversy.

Public controversy in Analysis Area 3 will center around 5 particular concerns, these are:

- numbers of brown bear, road access and open road density,
- subsistence; number of deer, road access and traditional use areas,
- new entry into roadless areas,
- perception of a road connection to Tenakee Springs,
- combined impacts of harvest and road construction on National Forest and adjacent private lands, to wildlife and watersheds.

### Alternative 1 - No Action-Current Direction

This alternative would continue current activities agreed to in the *Tenakee Springs v. Court-right Settlement Agreement* and would defer harvest and road construction activities as outlined in the *Hanlon v. Barton Settlement Agreement*. This alternative would allow APC to continue with operations in the Whitestone Harbor/Iyouktug area for two seasons but would only provide enough volume for approximately one operating season in the Freshwater Bay

area. This alternative would not meet the minimum volume level as set for this area in the Phase I DEIS. This would require that the Forest Service make up the additional volume in another analysis area, and could result in a possible breach of the contract if the volume could not be made up elsewhere. This alternative is considered moderate in effectiveness in dealing with subsistence issues and brown bear population viability. It proposes entry into VCU 212 which is currently roadless, proposes no entry into the deferred portion of VCU 204 and proposes no additional impacts to adjacent watersheds, or wildlife habitat due to combined effects of harvest and road construction on National Forest and adjacent ownerships. This alternative is considered moderate in effectiveness to implement TLMP guidelines for LUD III and IV VCUs.

#### Alternative 2 - No Further Harvest

This alternative is based on the approved APC 1989 operating plan. It proposes harvest of 63 MMBF during the current operating season, and no further harvest in Analysis Area 3 without completion of an additional NEPA process. This alternative is associated with the highest risk of the Forest Service defaulting the contract, for not only does it not meet the minimum volume requirement as specified in the Phase I DEIS, but it provides for less volume than the current situation. This would require the Forest Service to make up the 43 MMBF shortfall from the existing situation plus the 56-86 MMBF as specified in Phase I. This means that approximately 100-130 MMBF would have to be made available elsewhere to meet the contract obligations. This alternative defers harvest in all *Tenakee Springs v. Courtright* and *Hanlon v. Barton* units and it proposes entry into previously unroaded VCU 212. This alternative is considered the most effective at responding to concerns over subsistence and brown bear viability, but is considered low to moderate in effectiveness to implement TLMP guidelines for LUD III and IV VCUs.

*Heavy Planks, Chips, and Other Timber Products at the Wrangell Mill Waiting for Shipment*



## 2 Alternatives



### Alternative 3

This alternative picks up all of the volume deferred by *Tenakee Springs v. Courtright* and *Hanlon v. Barton* and proposes 15 MMBF of new volume in the Freshwater Bay area. This alternative proposes the highest level of road construction and timber harvest of all alternatives in Analysis Area 3. Because of this it is considered the most effective at meeting the contract volume needs and meets the harvest level set in the Phase I DEIS. This alternative also has the largest potential for public concern for the same reasons. It would be considered low in effectiveness at responding to concerns over subsistence and brown bear viability unless the proposed mitigation measures are adopted. This alternative proposes entry into previously unroaded VCUs 203 and 212 and the Upper Game Creek portion of VCU 204. There could be some potential for concern over combined impact of harvest and road construction activities in VCUs 204 and 208, due to both Native Corporation and National Forest harvest activities. This alternative would be highly effective at maintaining community stability in Hoonah and current employment levels for the logging contractors in the area and for the mills in Sitka and Wrangell. It is considered high in effectiveness to implement TLMP guidelines for LUD III and IV VCUs.

### Alternative 4

This alternative defers harvest in VCUs 203 and 204 and replaces that with volume from other VCUs within the analysis area. This alternative barely meets the minimum volume as specified in the Phase I DEIS. Because of the deferral of harvest in VCUs 203 and 204 and the higher level of harvest in other VCUs this alternative would be considered lowest of all the alternatives at responding to concerns over subsistence and brown bear viability. This alternative proposes entry into previously unroaded VCUs 211 and 212. Since no harvest is proposed in any VCUs adjacent to private land this alternative should have no combined impacts on either wildlife or watersheds due to timber harvest and road construction on National Forest and private lands. This alternative would be moderately effective at maintaining community stability in Hoonah and current employment levels for the logging contractors in the area and for the mills in Sitka and Wrangell. It is considered moderate in effectiveness to implement TLMP guidelines for LUD III and IV VCUs.

### Alternative 5

This alternative defers harvest in VCU 203, but proposes harvest in VCU 204 with units redesigned for wildlife concerns. VCU 211 would not be entered under this alternative, but VCU 212 would be entered. This alternative barely meets the minimum volume as specified for this area in the Phase I DEIS. This alternative was designed to minimize impacts to fish and wildlife and would be moderate in effectiveness in responding to subsistence and brown bear viability concerns. This alternative harvests less in VCU 204 than Alternative 3 and would therefore have less potential for combined impacts from National Forest and Native lands to the watersheds and wildlife. This alternative would be moderately effective at maintaining community stability in Hoonah and current employment levels for the logging contractors in the area and for the mills in Sitka and Wrangell. It is considered moderate in effectiveness to implement TLMP guidelines for LUD III and IV VCUs.

### Alternative 6

This alternative defers harvest in VCU 203, redesigns the units in VCU 204 to highlead and reduces the harvest from alternative 3 to 17 MMBF. This alternative would harvest the lowest volume of any of the action alternatives and would be moderate to high in its effectiveness at responding to concerns about subsistence and brown bear viability. There would be little potential from this alternative for combined impacts to wildlife and watershed due to harvest and road construction activities on National Forest and Native lands. This alternative would be moderately effective at maintaining community stability in Hoonah and current employ-

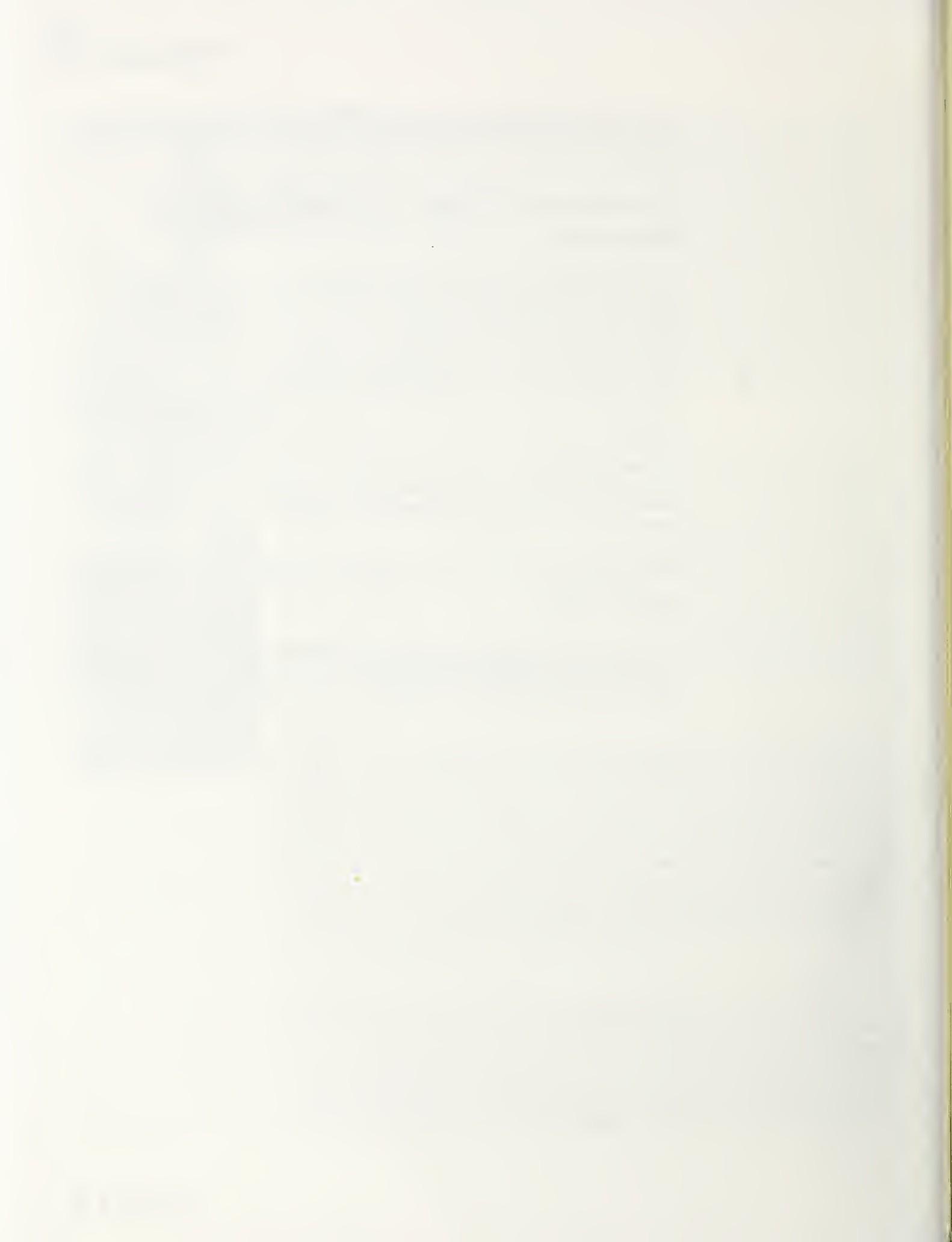
ment levels for the logging contractors in the area and for the mills in Sitka and Wrangell. It is considered moderate in effectiveness to implement TLMP guidelines for LUD III and IV VCUs.

## **Standards, Guidelines, and Mitigation Measures**

Numerous mitigation, enhancement, and preventative measures that are used by the Forest Service are defined in several Forest Service Handbooks, the Alaska Regional Guide (Forest Service 1983a), and the Tongass Land Management Plan (Forest Service 1979a, 1986d). Many of these guides were described in detail in the 1981-86 FEIS (Forest Service 1980a, Section III, Planning Alternatives and Recommendations) and in the 1986-90 FEIS (Forest Service 1986b, Subsection 2c). No new specific standards and guidelines were developed for the remainder of this Operating Period. Specific mitigation measures, as applied to each individual unit, can be seen in the "As Planned" unit layout cards. These unit cards are an important tool for implementing the project, as they list standards and guidelines and provide a mechanism for tracking the project implementation. In addition, specific road closure options are presented as a mitigation measure for potential brown bear impacts. Road closure options may also have an impact on recreation and subsistence users. Unit cards also contain an evaluation of the potential effectiveness of the mitigation measures being proposed. Unit Cards may be found in Appendix A-1.

## **Identification of the Forest Service Preferred Alternative**

The Chatham Area management team used an evaluation process which weighs the benefits and impacts of each alternative against the issues discussed in the Comparison of Alternatives Section, to recommend the preferred alternative. Alternative 3 is tentatively identified as the Forest Service preferred alternative, pending further evaluation in the Record of Decision.



# **Chapter 3**

## **Affected Environment**





# Chapter 3

## Affected Environment

This chapter provides information about the existing environment of Analysis Area 3 that may be affected by implementing any of the alternatives as described in Chapter 2. It includes discussions of soils, vegetation, access, logging facilities, timber volume, wildlife, fisheries, watersheds, marine environment, land status, recreation, visual characteristics, cultural resources, socioeconomics, and subsistence. The information presented here augments and summarizes sections addressing the affected environment of the 1981-86 and 1986-90 FEISs and the Phase I Draft SEIS. The area designated as Analysis Area 3, located on the northeastern portion of Chichagof Island, includes approximately 206,968 acres of National Forest land and is comprised of three management areas and 18 VCUs as follows:

- Freshwater Management Area C30: VCUs 203, 204, 214, 216, and 217 (LUD IV) and VCUs 213, 215, and 218 (LUD III)
- Whitestone Management Area C31: VCUs 205 through 210, and 212 (LUD IV) and VCU 211 (LUD III)
- Tenakee Management Area C32: VCUs 219 and 220 (LUD III) and VCU 221 (LUD IV)



*Recent Timber Harvest in Suntaheen Creek Watershed.*

### 3 Affected Environment

## Soils

Glacial history in Southeast Alaska has played an important part in the placement and character of soil parent material in many places. The development of soils is influenced by high levels of rainfall, cool summer temperatures, a short growing season, and moderately low soil temperatures. Under such conditions, organic matter decomposes slowly and tends to accumulate in areas where it is being produced or deposited. Because of the high rainfall, the available nutrients can be leached rapidly, and exposed mineral soils are subject to erosion. In general, the characteristics of the parent material, the topography, vegetation, and the soil development factors all influence the features of soils that affect and are affected by timber harvest activities.

In general, shallow soils with good drainage develop on steeper slopes due to rapid loss of material by erosion and efficient rainwater runoff. Deep, well drained soils commonly occur below shallow soils on gentler slopes where transported soil materials have collected. Poorly drained soils are associated with low relief and impermeable subsurface layers. In locations with poor drainage, deep organic soils (muskegs) tend to form. This situation occurs where the soil material fails to provide sufficient internal drainage or where topography prevents external drainage. These areas are generally not well suited for road construction since the soil materials tend to be wet and have associated low bearing strengths. Drainage improves with increased slope gradient; however, as slopes become oversteepened, soil depths become much shallower. In riparian areas, soil zones tend to contain sand and gravels as a result of flood deposition.

Soil productivity and nutrient status can be influenced in a number of ways. Removing the canopy of mature and overmature forest allows increased solar radiation to penetrate and warm the soil. This process leads to a temporary rise in available soil nutrients, particularly nitrogen. The result is a proliferation of rapidly growing forbs, shrubs, and tree seedlings. Consequently, the total annual biomass production may be greater than it was in the slow growing forest. Thus, total soil productivity increases, at least temporarily, after logging. The duration of the increase is not known. However, many soils hold a high percentage of their stored plant nutrients in the duff (organic humus) layer on or within a few inches of the surface. Removing the duff layer can reduce the supply of available plant nutrients and soil productivity. Without the trees to recycle nutrients, some are lost through leaching; but because of the large accumulations of surface organic matter and the rapid regrowth of vegetation, such losses are negligible.

The potential for sediment production (sedimentation of streams) is based upon soil properties that are important when a site is disturbed by natural or management-induced means. These soil properties include erodability, mass wasting (landslide) hazard, quantity of soil material available as sediment, amount of unvegetated or bare soil, and the effects of climate (e.g., intensity and frequency of rainfall).

Most undisturbed soils in Analysis Area 3 are resistant to surface erosion. Relatively thick layers of surface organic matter and surface mats of vegetation act as protective covers that minimize surface erosion. However, natural sources of surface erosion and mass wasting do exist, and include streambanks, snowslide or avalanche slopes, and V-notches.

Landslide hazard classes are used to group soil/landtype units that have similar properties regarding the stability of natural slopes. Four hazard classes (extreme, high, moderate, and low) rank soil/landtype units according to their relative potential for mass wasting. The Forest Service now avoids scheduling timber harvest or road building on the extreme hazard soil/landtype units that are least stable and have the greatest probability of slope failure.

These extreme hazard soils include shallow, fine textured soils on slopes of 75 percent or greater, as well as some soils with restricted drainage on slopes in excess of 65 percent. Nearly all naturally occurring landslides are found on extreme hazard soil/landtype units. These areas often have visible indications of instability or past failures, such as slide scarps, tension cracks, or jackstrawed trees.

Soil mass movement is the dominant process of natural erosion in Southeast Alaska. The Forest Service has inventoried over 3,800 natural, large scale landslides that have occurred in the Tongass National Forest within the past 150 years (Forest Service 1977). Many landslides occur during or immediately after periods of heavy rainfall when soils are saturated. Particularly hazardous areas are steep slopes characterized by compacted glacial till or bedrock sloping parallel to the surface. When subjected to heavy rainfall, these areas have a relatively high likelihood of mass movement, especially if disturbed by blasting during periods of soil saturation, side casting of excavated material, or logging practices that cause substantial surface disturbance.

Recent research on landslides in Southeast Alaska (Swanson 1989) has concluded that most landslides occur in unique topographical situations (slopes in excess of 75 percent hillslope depression). Although over 90 percent of all landslides in the past 20 years were not related to logging or roads, logging and roads do increase the potential for landslides in a given site. Naturally occurring slides tend to be larger and travel farther than logging related slides. Only three percent of all slides reach anadromous fish streams.

Vegetation, tree roots in particular, seems to have a stabilizing effect on slopes. Tree roots decrease significantly to minimum strength five to seven years after the tree is cut. This decrease in soil holding capability results in a higher likelihood of soil movement on steep slopes following clearcutting. Further, the displaced roots of uprooted trees can disturb the soil mantle whenever windthrow occurs. Under natural conditions, windthrow is an important triggering device of debris avalanches and flows in Southeast Alaska. The degree of predictability is complicated by an interaction of factors such as soil depth, texture, and coarse fragment content.

The following soils-related information for Analysis Area 3 is presented by VCU.

VCU 203: This VCU borders on non-Forest Service land to the north and on Port Frederick at the northeast corner. It is dissected by Seagull Creek in the eastern part of the VCU and by an unnamed stream (114-32-6) in the western part of the unit.

A large, sparsely vegetated mudflat is located along the northeastern corner of the VCU at Port Frederick. Gently sloping lowlands comprise much of the landscape in the northern part of the VCU between the two stream systems. The soils on the lowlands are a mixture of deep organic soils and poorly to very poorly-drained mineral soils. Riparian zones (containing sands and gravels) are located near the headwaters of both stream systems. Areas of extreme mass movement hazard are primarily concentrated along the upper reaches of both stream systems. These areas consist of very steep mountain slopes influenced by snow avalanches and mass wasting. Oversteepened alpine mountain slopes, rounded alpine summits, and rugged alpine topography are common in the southern part of the VCU.

VCU 204: Located inland, this VCU borders on non-National Forest land along the north side. Game Creek, the unit's major stream system, has several tributaries that dissect the VCU.

Gently sloping lowlands occupy much of the northwestern and southeastern areas of the VCU. These soils are primarily poorly drained and support low productivity coniferous forest interspersed with deep organic muskegs.

A large floodplain or riparian zone, located along Game Creek, has deep alluvial soils. Some extreme mass movement hazard soils are located on very steep mountain slope along a portion of this zone. Other riparian zones are present along the tributaries of Game Creek, most notably in the southwestern part of the VCU. They occur on gently sloping footslopes and alluvial fans and are frequently surrounded by areas of extreme mass movement hazard. These riparian zones typically have alluvial soils. The areas associated with extreme mass movement hazard soils include very steep mountain slopes that are influenced by snow avalanches and mass wasting.

### 3 Affected Environment

A riparian zone, present in the central part of the watershed, also contains deep alluvial soils and an associated area of extreme mass movement hazard. Rugged alpine topography and oversteepened alpine mountain slopes are present in the southern and eastern parts of the VCU.

VCU 205: The northern and southwestern areas of VCU 205 border on non-National Forest land. Gartina Creek dissects the area into two regions.

The northern portion of the VCU consists primarily of gently sloping lowlands, which typically contain shallow, well-drained soils. The remainder of the northern portion has gentle slopes and soils with poor drainage. Much of the southern part of the VCU is associated with an extreme mass movement hazard. The extreme hazard areas consist of very steep mountain slopes influenced by snow avalanches and mass wasting and of mountain slopes dominated by cliffs and rock outcrops. Oversteepened alpine mountain slopes and rugged alpine topography are also present.

VCU 207: VCU 207 consists of a narrow strip of land that surrounds a relatively large area of non-Forest Service land. Spasski Creek is the main stream associated with this VCU, but only small parts of the stream and its tributaries are actually located on Forest Service land.

Much of the VCU contains an extreme mass movement hazard. Most of these areas are associated with oversteepened mountain slopes and mountain slopes influenced by snow avalanches and mass wasting.

Riparian zones are located along tributaries of Spasski Creek and are adjacent to areas of extreme mass movement hazard in the southern and western parts of the VCU. These zones typically have deep alluvial soils.

Rounded alpine summits are common in the southwestern part of the VCU. Rugged alpine topography is present along the southern boundary. The steeper mountain slopes typically have thin, well-drained soils.

VCU 208: This VCU borders on Icy Strait. One unnamed stream system (114-27-26) which



*Timber Harvest on Huna Totem Corporation Lands Near Hoonah.*

flows into Icy Strait, is located in the central portion of the VCU. The upper reaches of another unnamed stream system, which flows into Whitestone Harbor in VCU 209, are located in the eastern portion.

Most of the VCU consists of gently sloping lowlands, which contain poorly-drained soils that are moderately deep to very deep and frequently overlie compacted till. A riparian zone with deep alluvial soils is located in the western part of the VCU immediately adjacent to an area of extreme mass movement hazard. Few other extreme hazard areas predominately associated with oversteepened mountain slopes occur within the unit.

Much of the northern shoreline of VCU 208 consists of steep, rocky headlands.

VCU 209: VCU 209 is dissected by Suntaheen Creek and its tributaries, which drain into Icy Strait at Whitestone Harbor, and one other unnamed stream system (114-27-18), which also flows into Whitestone Harbor.

Much of the northern portion of the VCU consists of gently sloping and flat lowlands, which contain poorly-drained mineral soils. The northern part of the VCU also contains two small floodplains near Whitestone Harbor, both of which contain sandy and gravelly soils.

Hillslopes and mountain slopes inland from the lowlands typically contain well-drained mineral soils on slope gradients of less than 75 percent. Soil depths range from shallow to deep. Many of the productive soils are located adjacent to areas that have an extreme mass movement hazard. The extreme hazard areas are mostly very steep mountain slopes that are influenced by snow avalanches and mass wasting.

Riparian zones, located adjacent to the major tributaries of Suntaheen Creek, have deep, alluvial soils. About half of the riparian areas are adjacent to zones of extreme mass movement hazard. A small floodplain is located along the other unnamed stream system near Whitestone Harbor.

A large, sparsely vegetated mudflat with deep, poorly-drained soils is located at the head of Whitestone Harbor. Rock headlands are present along Icy Strait. Rugged alpine topography and rounded alpine summits are scattered throughout the southern half of the VCU and account for areas of thin, well-drained soils.

VCU 210: The VCU is bounded by Icy Strait on the north and Chatham Strait on the southeast. Iyouktug Creek, which flows into Chatham Strait, is the major stream system in the unit although another stream (114-27-12) also enters Icy Strait. Iyouktug Creek splits into four branches less than a mile from False Bay.

A large floodplain with deep alluvial soils is located along Iyouktug Creek and its southern tributary. Gently sloping lowlands and infrequently dissected footslopes are also located along Iyouktug Creek, especially to the north. The soils overlying compacted till are poorly drained. Infrequently dissected and broken mountain slopes that parallel the stream system contain primarily well-drained and moderately deep to deep soils. Areas of extreme mass movement hazard are located south of Iyouktug Creek. Most of these areas consist of very steep mountain slopes influenced by snow avalanches and mass wasting. A sparsely vegetated mudflat with relatively deep, poorly-drained soils is present at False Bay.

The northern half of the VCU has relatively small areas of extreme mass movement hazard (mostly associated with broken and smooth hillslopes and mountain slopes) and few riparian areas. The rest of the northern part of the VCU is mostly a combination of broken hillslopes, gently sloping lowlands, and infrequently dissected mountain slopes. Rock headlands are located along the northern shoreline. Rugged alpine topography, oversteepened mountain slopes, and rounded alpine summits containing thin, well-drained soils are common along the southern VCU boundary.

VCU 211: The northern and eastern boundaries of VCU 211 form the shoreline at the junction of Icy Strait and Chatham Strait. Over half of the shoreline is comprised of rocky headlands.

### 3 Affected Environment

Although several streams dissect the VCU, few riparian zones or floodplains are present. Highly productive soils occur on broken and smooth mountain slopes on gradients that are generally between 55 and 75 percent. The majority of these soils are deep and well drained, although some are shallow and relatively poorly drained. A large area of gently sloping hillslopes with poor drainage is also located in the unit.

An area of extreme mass movement hazard is located in the western part of the VCU on very steep mountain slopes influenced by snow avalanches and mass wasting. Oversteepened alpine mountain slopes and rounded alpine summits are present in the western part of the VCU.

VCU 212: The VCU, which borders on Chatham Strait at Iyoukeen Cove, is dissected by Gypsum Creek along the southern border and Wukuklook Creek near the northern border.

Wukuklook Creek contains a large riparian zone, the lower portion of which is a floodplain. Riparian zones along the southern stream system are similar to those along Wukuklook Creek but are not as extensive.

Three ridgelines occur within the VCU. One ridgeline separates the two stream systems. The other ridgelines form the northern and southern boundaries of the VCU. The ridges consist of rugged alpine topography, rounded alpine summits, and oversteepened alpine mountain slopes with thin, well-drained soils. Many of the steep mountain slopes below the ridges have an extreme mass movement hazard, influenced predominantly by snow avalanches and mass wasting. Riparian zones are commonly located adjacent to these areas of extreme hazard.

The soils associated with footslopes, hillslopes, and some of the mountain slopes are primarily well drained and range from shallow to deep. Many of the soils overlie calcareous bedrock. Less productive soils occur in areas where drainage is restricted by the presence of compact till.

Sparingly vegetated mudflats and beach deposits are found along the shoreline.

VCU 213: This VCU borders on Freshwater Bay and includes the Iyoukeen Peninsula. It is a small VCU that has relatively few riparian zones or areas of extreme mass movement hazard.

The soils are primarily well drained and range from shallow to deep. Some overlie calcareous bedrock. Relatively poorly-drained soils are located primarily on the few gently sloping lowlands that are found in the VCU.

Some areas of extreme mass movement hazard occur on very steep mountain slopes that are influenced by snow avalanches and mass wasting, and on mountain slopes dominated by cliffs and rock outcrops.

Oversteepened mountain slopes and rounded alpine summits with thin, well-drained soils are present along the northern VCU boundary.

VCU 214: Bordering on Freshwater Bay, VCU 214 contains the Seal Creek stream system. A sparsely vegetated mudflat with relatively deep, poorly-drained soils is located at the mouth of Seal Creek. Seal Creek branches into three main tributaries about 1.5 miles from Freshwater Bay.

The highly productive areas of this VCU typically have well drained soils that range from shallow to deep on slope gradients of less than 75 percent. Calcareous bedrock is common throughout the VCU.

Riparian zones containing alluvial soils are present primarily near the upper reaches of Seal Creek. Most areas of extreme mass movement hazard are located adjacent to the riparian zones and consist of very steep mountain slopes influenced by snow avalanches and mass wasting and of mountain slopes dominated by cliffs and rock outcrops. The soils are typically shallow and well drained.

Rugged alpine topography, rounded alpine summits, and oversteepened alpine mountain slopes are common along the VCU boundary.

VCU 215: VCU 215 contains three major stream systems: Freshwater Creek dissects the southern part of the VCU; North Fork Freshwater Creek dissects the central part; and an unnamed stream system (112-50-32) dissects the northern part.

Lowlands and rolling hill country dominate much of the landscape between mountain ridges in the VCU. These areas contain a mixture of poorly-drained mineral and organic soils that overlie compact till, and shallow, well-drained soils in areas where compact till is absent.

Extensive areas having an extreme mass movement hazard are located on the very steep mountain slopes influenced by snow avalanches and mass wasting, and on mountain slopes dominated by cliffs and rock outcrops. These areas are common above all three stream systems and are frequently adjacent to riparian zones.

Riparian zones are common and occur on dissected footslopes and alluvial fans, especially along North Fork Freshwater Creek and the northern stream system.

Rugged alpine topography, rounded alpine summits, and oversteepened alpine mountain slopes are common along inland portions of the VCU boundary. Sparsely vegetated mudflats are present along the shoreline of Freshwater Bay. Some floodplains are located in the riparian zones along North Fork Freshwater Creek.

VCU 216: VCU 216 contains the headwaters of Freshwater Creek and its tributaries. This VCU does not adjoin any body of saltwater.

Extensive riparian zones (including alluvial soils), present in the southern half of the VCU, are located on frequently dissected footslopes, on alluvial fans, and, to a minor extent, on floodplains.

Surrounding several of the riparian zones are areas of extreme mass movement hazard. These areas of very steep mountain slopes are influenced by snow avalanches and mass wasting. Gentler mountain sideslopes and footslopes typically contain soils that are at least moderately well drained.

Scattered throughout VCU 216 are lowlands and footslopes that have poor drainage. Most of these areas overlie compact till. Rugged alpine topography, oversteepened alpine mountain slopes, and rounded alpine summits are common along the VCU boundary.

VCU 217: VCU 217 borders on Freshwater Bay and is dissected by Kennel Creek and its tributaries. The VCU includes the Redcliff Islands and Cedar Island, which are all located in Freshwater Bay.

Kennel Creek contains a large riparian zone, much of which is also a floodplain. The floodplain areas have deep alluvial soils, which are subject to seasonal flooding.

Areas of extreme mass movement hazard are scattered along the boundary of the VCU on very steep mountain slopes influenced by snow avalanches and mass wasting, and on some mountain slopes dominated by cliffs and rock outcrop. These areas also occur adjacent to riparian zones in the western part of the VCU near the headwaters of one of the tributaries to Kennel Creek. Much of VCU 217 contains well-drained soils, both shallow and deep, on smooth and broken mountain slopes and on some of the footslopes. Many of the soils near the shoreline overlie calcareous bedrock.

Rounded alpine summits and oversteepened alpine mountain slopes are common along the VCU boundary.

VCU 218: VCU 218 borders on Freshwater Bay and is dissected by Pavlof River and its tributaries. Pavlof River flows into Pavlof Lake, which in turn flows into Freshwater Bay at Pavlof Harbor.

Much of the eastern half of the VCU consists of lowlands, rolling hill country, and footslopes. Sparsely vegetated mudflats with reduced drainage are located at Pavlof Harbor and Wachusett

### 3 Affected Environment

Cove on Freshwater Bay. The soils often overlie compacted till. The rolling hill country, some of the footslopes, and the mountain slopes throughout the VCU have better drainage. Calcareous bedrock underlies some of the more productive soils, especially near Freshwater Bay. Soil depths range from shallow to deep.

Extensive riparian zones exist in the western half of the VCU and are located on frequently dissected footslopes and alluvial fans. Areas of extreme mass movement hazard are most common in the southwestern portion of the VCU where very steep mountain slopes are influenced by snow avalanches and mass wasting. Some mountain slope ravines are also present. Many of these hazardous areas are adjacent to the riparian zones.

Rugged alpine topography, rounded alpine summits, and oversteepened alpine mountain slopes are common, especially in the western part of the VCU near the boundary.

VCU 219: This VCU borders on Tenakee Inlet. The southwestern portion of the VCU adjoins non-Forest Service land. Harley Creek dissects the VCU but does not enter Tenakee Inlet on Forest Service land. Another stream (112-41-24) dissects the VCU and enters Tenakee Inlet at Coffee Cove.

Riparian zones are located in the northwestern portion of the VCU along Harley Creek and in the central part of the unit near Coffee Cove. The riparian zones are located on frequently dissected footslopes and contain alluvial soils.

Almost all areas of extreme mass movement hazard are located in the northwestern part of the VCU. These mountain slopes are influenced by snow avalanches and mass wasting, and are located adjacent to the less productive riparian zones along Harley Creek.

Areas of highly productive timber are located throughout the VCU on footslopes and on smooth and broken mountain slopes. The soils are mostly well drained and range from shallow to deep. Some of the soils are formed in colluvium and others in alluvium, especially near the shoreline on alluvial fans. Calcareous bedrock is common in these areas.

Poorly-drained soils are scattered throughout the VCU in areas underlain by compacted till.

VCU 220: The VCU is located adjacent to Tenakee Inlet but is separated from it by non-Forested Service land that includes the town of Tenakee Springs. The VCU is dissected by the Indian River.

Indian River contains an extensive riparian zone that extends from Tenakee Inlet to its headwaters. Floodplains are present on the upper half of the river system.

Extensive areas of extreme mass movement hazard are located at the northwestern end of the VCU and along the northeastern boundary below alpine landforms. These areas are located on very steep mountain slopes influenced by snow avalanches and mass wasting, and on mountain slope ravines.

The highly productive forested sites located on the mountain slopes and footslopes adjacent to the stream system are typically well drained and have soils that range from shallow to deep. However, many areas on the north side of the Indian River overlie calcareous bedrock.

Less productive areas are common where soils are underlain by compacted till. These areas have restricted drainage and relatively gentle slope gradients. They commonly occur on gently sloping lowlands, rolling hill country, and broken mountain slopes.

Large areas of rugged alpine topography, rounded alpine summits, and oversteepened alpine mountain slopes are common along the inland boundaries of the VCU.

VCU 221: The VCU borders Tenakee Inlet. The southeastern boundary of this unit is adjacent to land belonging to Tenakee Springs.



Frequently dissected footslopes containing well-drained soils are common along the shoreline of Tenakee Inlet. The footslopes grade into smooth mountain slopes that are steeper than 75 percent. These steep mountain slopes contain well-drained and very shallow to deep soils.

Extreme mass movement hazards are typically present above very steep mountain slopes, mountain slope ravines, and mountain slopes influenced by snow avalanches and mass wasting.

Rounded alpine summits and oversteepened alpine mountain slopes are common along the inland boundary of the VCU. These alpine areas consist of very shallow to shallow organic and mineral soils.

## Vegetation

Western hemlock-Sitka spruce forests dominate the overstory of the Southeast Alaska rain forest. The understory is composed of shrubs such as red huckleberry, rusty menziesia, and devil's club; and the forest floor is covered with a mat of mosses, liverworts, and plants such as deerheart, bunchberry dogwood, single delight, and skunk cabbage. Streamside riparian vegetation is characterized by salmonberry, devil's club, alder, grasses, ferns, and currants.

Muskegs, dominated by sphagnum mosses, sedges, and shrubs of the heath family, are interspersed among low elevation timber stands where drainage is restricted. Trees are sparse and consist mainly of stunted hemlock, lodgepole pine, and Alaska-cedar.

Common marine plants in near-shore waters include brown, red, and green algae, and eelgrass. Tide flats are found at the heads of many of the bays and estuaries and are usually associated with stream estuaries. The tide flats generally support sea milkwort, glasswort, and algae. Beach meadows occur between the shore and the forest. Lower beach meadows are composed of beach ryegrass, red bent grass, hairgrass, fescue grass, beach lovage, goose tongue, and sedges. Upper beach meadow plants include yarrow, bedstraw, starwort, ferns, western columbine, and cow parsnip. Oregon crabapple, alder, devil's club, and blueberry occur along the border of the beach meadow and the forest.

At elevations generally above 2,000 feet, the plant communities are characterized by low shrubs, grasses, and sedges. Subalpine forests and meadows occur at the interface between the forested communities and the alpine tundra.

## Threatened and Endangered Plant Species

Currently there are no plant species located in the APC Contract area that are listed nor that are candidates for listing by the US Fish and Wildlife Service as threatened or endangered. Murray and Lipkin (1987) list none for Southeast Alaska.

## Timber

Western hemlock and Sitka spruce dominate timber stands throughout Southeast Alaska and Analysis Area 3. Other timber species include Alaska-cedar (also known as yellow-cedar), mountain hemlock, red alder, and lodgepole pine.

Western hemlock and Sitka spruce develop best on well drained valley bottoms and lower slopes. However, they also occur anywhere between sea level and timberline. Both are harvested for commercial purposes. Alaska-cedar occurs in limited numbers in stands throughout the APC Contract area and is a highly valued commercial species. This species is able to grow on extremely poor soil if the moisture supply is abundant. Alaska-cedar is mostly found on muskegs on low volume sites (Volume Class 4: 8 to 20 MBF/acre) where competition is less. Recent data indicate that Alaska-cedar comprises 4 percent of Volume Class 4 stands and 1 percent of Volume Class 5 stands. See the following section on Commercial Forest Land for definitions of volume classes.

## 3 Affected Environment

Noncommercial species include red alder, which is often found along beaches and streams and on steeper slopes where soils have been highly disturbed, such as logging unit landings, spur roads, and cable roads. Lodgepole pine (also called shore pine) is found in muskegs.

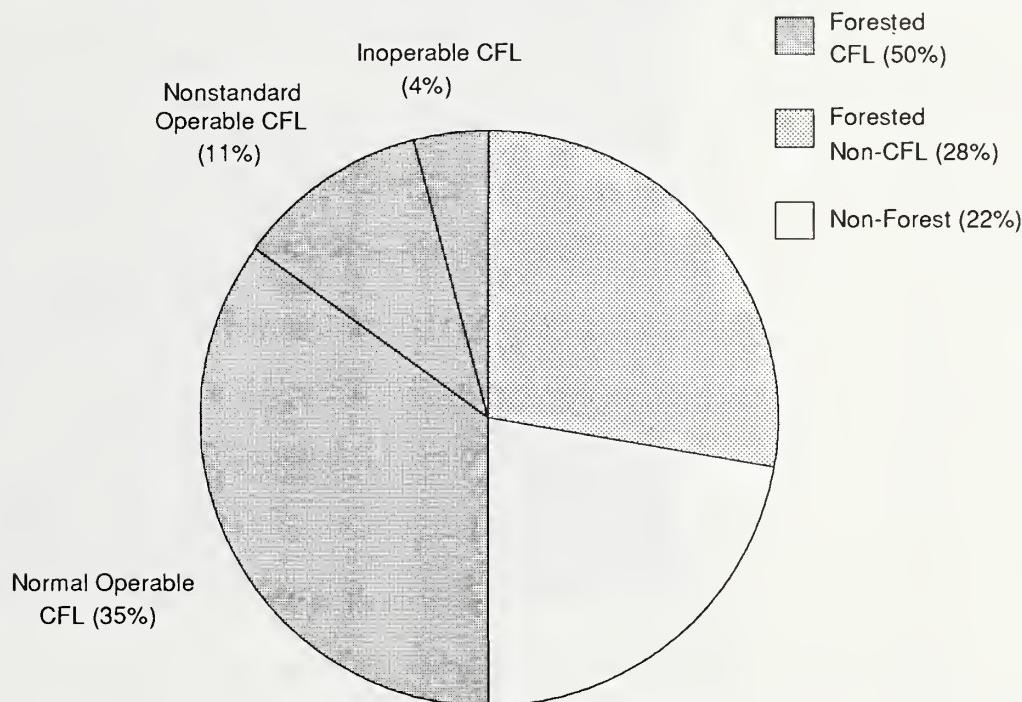
### Mature and Overmature Timber

Much of the commercial forest land in the Tongass National Forest that has not been previously harvested has been undisturbed for centuries and is considered mature or overmature. These stands are also commonly referred to as climax plant communities or old-growth forests. In this document, “old-growth forest” refers to a habitat type characteristic of some mature and overmature stands. The affected “old-growth forest habitat” environment is discussed in the Wildlife section of this chapter.

Mature and overmature stands have an uneven appearance because they contain trees of many ages, sizes and condition, with many dead tops and snags. In contrast, stands that have been disturbed during the last 100 to 200 years by fire, landslide, windthrow, or logging have a more uniform appearance because they contain trees of relatively uniform age and size with fewer snags and defective trees. Even-aged stands convert to uneven-aged stands as insects, disease, wind, and ice weaken and kill trees, opening up the stand for new growth to enter. The change from even-aged to uneven-aged to all aged is a continuing process. Harvested mature stands are returned to even-aged stands as they regenerate.



Figure 3-1

**Percentage of Timber Land Types in Analysis Area 3**

SOURCE: Tongass Land Management Plan aerial photo points inventory, Forest Service Region 10, Juneau, AK.

Based on past forest inventories, overmature stands are assumed to have reached an equilibrium in productivity, where they no longer increase in biomass. Establishment of new trees depends on the death of existing trees, which provides space in the stand and sunlight through the canopy. Although most of the timber in mature and overmature stands is of declining commercial quality, it is suitable for the production of pulp. Sitka spruce and Western hemlock in these mature stands provide some of the finest quality commercial timber for lumber.

**Commercial Forest Land**

Depending on its vegetative cover, land in the Tongass National Forest has been categorized as commercial forest land (CFL), noncommercial forest land, or nonforest (Figure 3-1). Information on this figure and the following estimates include both National Forest land and Native lands within external boundaries of the Tongass National Forest. About 50 percent of the land in Analysis Area 3 consists of CFL, which is land producing or capable of producing continuous crops of timber and that has not been withdrawn from the timber base by statute or administrative action. The Forest Service has specified that in order to be capable of commercial timber production, the land must be able to produce 20 cubic feet/acre/year, or have 8 thousand board feet (MBF)/acre of net timber volume (Forest Service 1978). Mature, overmature, and second-growth stands, as well as areas that have been logged and/or regenerated, may qualify as CFL. CFL also includes accessible and inaccessible areas.

Non-CFL makes up about 28 percent of Analysis Area 3. Non-CFL is forested land that is not capable of producing commercial quantities or has been withdrawn from the timber base. The remaining 22 percent of Analysis Area 3 is classified as nonforest and includes salt marshes and estuaries, alpine areas, and nonvegetated mountain tops.

### 3 Affected Environment

*Long Island Log Transfer Facility in Port Frederick Sound.*



Commercial forest land in the Tongass National Forest has been classified into volume classes. Each volume class represents a range of timber volume per acre. Placing the timber in volume classes allows the Forest Service to roughly estimate the volume for each VCU. Volume Classes 1 through 3 include CFL containing less than 8 MBF/acre. Volume Class 1 includes non-stocked stands that have been recently burned or logged. Seedling/sapling stands with less than 8 MBF/acre are placed in Volume Class 2, and pole timber stands with less than 8 MBF/acre are placed in Volume Class 3. Timber in Volume Class 4 contains 8 to 20 MBF/acre; in Volume Class 5, 20 to 30 MBF/acre; in Volume Class 6, 30 to 50 MBF/acre; and in Volume Class 7, greater than 50 MBF/acre.

Table 3-1 shows the acres of CFL in Volume Classes 4 through 7 in Analysis Area 3, by VCU on National Forest, State, and Native corporation land.

#### Operable and Inoperable CFL

Commercial forest land is further classified as inoperable CFL, normal operable CFL, or non-standard operable CFL (see Figure 3-1 for the distribution in Analysis Area 3). Inoperable stands are those in which potential resource damage or physical limitations make harvest of trees or impractical and/or uneconomical. The primary difference between normal operable and nonstandard operable CFL is that normal stands have less potential for erosion and slope failure than nonstandard stands.

Because of their lower erosion potential, normal operable stands may be logged using conventional systems, including 1,250-foot highlead; 1,000-foot short-span skyline; 1,000- to 2,000-foot intermediate-span skyline; 2,000- to 2,600-foot long-span skyline; cold, deck, and swing-track loader; or A-frame. Logging nonstandard operable stands could result in soil erosion or slope failure if careful logging techniques are not used. Nonstandard yarding techniques, which result in less impact on soils than highlead logging systems, may be employed to log nonstandard operable stands. Nonstandard techniques include: multi-span skyline, long-span skyline, and helicopter and balloon yarding systems.

Table 3-1  
**Commercial Forest Land by Volume Class in Acres**

VCU	4	Volume Class <sup>1</sup>			7
		5	6		
<i>National Forest Land</i>					
203	1,759	1,270	489	0	
204	6,429	3,369	792	215	
205	895	331	237	0	
207	2,260	2,260	1,081	0	
208	916	784	102	0	
209	3,004	2,468	322	0	
210	3,603	2,802	534	0	
211	1,372	800	800	0	
212	3,034	3,359	542	0	
213	741	1,607	247	0	
214	1,273	1,175	196	0	
215	4,005	4,339	2,893	111	
216	1,699	1,133	1,019	0	
217	1,216	2,026	2,634	0	
218	4,088	2,935	1,991	0	
219	1,380	1,610	460	0	
220	2,829	2,619	2,634	0	
221	657	657	438	0	
Subtotal	41,160	35,544	17,411	326	
<i>Native Corporation and Other Lands</i>					
204	1,480	814	177	0	
204 <sup>2</sup>	96	0	0	0	
205	1,788	668	648	0	
206	1,008	2,099	923	0	
207	1,998	4,280	2,856	0	
208	0	132	0	0	
219 <sup>3</sup>	169	197	57	0	
220 <sup>3</sup>	469	434	437	0	
221 <sup>3</sup>	56	56	38	0	
Subtotal	7,064	8,680	5,136	0	
Total	48,224	44,224	22,547	326	

SOURCE: Tongass Land Management Plan aerial photo points database, USFS Region 10, Juneau, AK, and SEIS Planning Record.

<sup>1</sup> Volume Classes 1 through 3 (not presented) contain less than 8 MBF/acre, Volume Class 4 contains 8-20 MBF/acre; Volume Class 5 contains 20-30 MBF/acre; Volume Class 6 contains 30-50 MBF/acre; and Volume Class 7 contains 50 or more MBF/acre.

<sup>2</sup> State of Alaska land is located in VCU 204.

<sup>3</sup> The City of Tenakee Springs and State of Alaska own land in VCUs 219, 220, and 221.

### **3 Affected Environment**

*Thinning Young Second Growth Timber Stands Enhances Growth.*



#### **Timber Harvested**

Most of the timber harvested to date and planned for harvest in the Tongass National Forest and in Analysis Area 3 has been from mature or overmature stands. Occasionally, second-growth stands (younger, even-aged stands that grew after removal of the previous timber stand) originating from wind or landslide disturbance are harvested. Commercially harvested species include western and mountain hemlock, Sitka spruce, and Alaska-cedar. Table 3-2 provides a summary of the timber acreage harvested during each five-year period and to date in Analysis Area 3. Concern for protecting resources other than timber, including soils, water quality, fish and wildlife habitat, and visual resources, limit the acreage that may be harvested within 20-year increments. The Alaska Regional Guide (Forest Service 1983a) explains the Tongass National Forest Policy for these resources. Options for road locations and the need to provide economically feasible harvest units also place limitations on the amount of timber that can be harvested.

#### **Silvicultural Treatments**

Regeneration is the process of establishing a new crop of trees on the harvested units. Beginning in 1976, regeneration has been certified by a silviculturist in the Tongass National Forest. Regeneration of a harvest unit may be certified when it is adequately stocked with healthy young trees, usually within three to five years after a stand has been harvested. Analysis Area 3 reforestation records contain data on harvest units logged between 1964 and 1988, totaling 7,560 acres. Of this total, 4,466 acres are being reforested by natural seeding, and 1,040 acres have been hand planted. Over 53 percent of all the acres examined have been certified for regeneration. Stands that have been harvested between 1985 and 1988 are expected to have enough natural regeneration to be certified by 1993.

Table 3-2  
Past Timber Harvest in Acres (TLMP)

VCU <sup>1</sup>	Pre-1981 Harvest	1981-1986 Harvest	1986-1990 Harvest <sup>2</sup>	Total Harvest
<i>National Forest Land</i>				
203	138	0	0	138
204	0	432	0	432
208	0	0	90	90
209	0	0	1,854	1,854
210	0	0	1,120	1,120
212	0	0	197	197
214	0	0	209	209
215	108	446	1,047	1,602
216	35	452	0	487
217	742	459	0	1,201
218	827	335	642	1,804
219	212	0	34	246
220	548	248	0	796
221	245	0	0	245
Subtotal	2,855	2,372	5,193	10,421
<i>Native Corporation and Other Lands<sup>3</sup></i>				
205				1,938
206				1,108
207				2,777
208				35
219 <sup>4</sup>				80
220 <sup>4</sup>				448
Subtotal				6,386
Total				16,807

SOURCE: Tongass Land Management Plan aerial photo points inventory, USFS Region 10, Juneau, AK.

<sup>1</sup> No harvest has taken place on Forest Service lands in VCU's 203, 205-207, 210-214.

<sup>2</sup> Acreage represents harvest as of September 1, 1988.

<sup>3</sup> Yearly data not available.

<sup>4</sup> City of Tenakee Springs land.

### 3 Affected Environment

Table 3-3

#### Timber Volume Available from Nondeferred and Partially Deferred VCUs

VCU	Acres	Timber Available 8/1/89	
		Volume (MBF)	
204	21		485
210	82		2,228
212	861		22,039
213	117		2,537
214	296		7,868
215	65		1,506
217	56		1,129
218	20		511
219	91		1,604
Total	1,609		39,906

SOURCE: Hoonah Ranger District unit status database, Hoonah, AK.

In Analysis Area 3,901 acres have been precommercially thinned. Precommercial thinning is the selective removal of trees from second-growth stands 12 to 20 years old. Thinning is conducted to reduce competition among the trees in the stand, causing the remaining trees to grow faster and larger. Precommercial thinning also benefits other resources such as wildlife by allowing more light to reach the forest floor, increasing understory production.

#### Timber Volume Available

The Federal District Court decision of June 24, 1987 (*Tenakee Springs v. Courtright*) resulted in a deferral of timber harvesting in certain parts of the APC Contract area. In Analysis Area 3, harvest in VCUs 203 and 216 has been deferred. Harvest in VCU 204 has been partially deferred.

In another Federal District Court decision of November 14, 1988 (*Hanlon v. Barton*), timber harvest in certain parts of Analysis Area 3 was deferred. Harvest of 19 MMBF over 16 harvest units in 5 VCUs (208, 209, 210, and 212) was deferred pending completion of this Supplement. Construction of a log transfer facility at Whitestone Harbor was also deferred.

Since preparation of the Phase I SEIS began on December 7, 1987, harvesting of timber has continued on certain nondeferred units. Table 3-3 provides the acreage of timber in Analysis Area 3 available to APC as of August 1, 1989.

#### Timber Harvest Modifications from APC 1981-86 ROD and APC 1986-90 ROD

The *Tenakee Springs v. Courtright* decision has required the Forest Service to document in this SEIS any changes in timber harvest from what was planned in the Records of Decision for the APC 1981-86 and 1986-90 Final EISs. In addition, the Forest Service is required to evaluate any environmental impacts resulting from such changes. The purpose of this section is to address this public concern while satisfying the above requirements.

Table 3-4 summarizes the changes in timber harvest from both the APC 1981-86 and 1986-90 RODs. The changes result in a net increase of 60 acres over those cleared by the earlier RODs.

Table 3-4

**Timber Harvest Unit Modifications From the 1981-86 and 1986-90 RODs**

Planning Period	Number of Units	Deleted (acres) <sup>1</sup>	Added (acres) <sup>2</sup>	Change (acres)
1981-86	26	-64	111	47
1986-90	43	-294	297	3
1981-90 Blow-Down Salvage	1	0	10	10
Total	70	-358	418	60

SOURCE: Hoonah Ranger District sale administration records, Hoonah, AK.

<sup>1</sup> Acres planned for harvest in ROD, but not harvested.

<sup>2</sup> Acres harvested but not planned for in ROD.

The planning record shows that of the total of 26 harvest units in the 1981-86 ROD and 43 in the 1986-90 ROD that were modified, the large majority were small changes that were necessary to implement the Standards and Guidelines or that would reduce the risk of environmental impact. For example, some harvest units were reduced in size or changed in configuration to protect fish-bearing streams, to protect wildlife habitat, or to avoid hazardous soils. These protective measures sometimes resulted in other parts of a unit becoming infeasible to log. Another source of apparent modification results from use of the more precise data on acreage and configuration that becomes available from on-site work in preparing the harvest units rather than the planning-level data from aerial photographs that were necessarily used for the EISs. There were both increases and decreases in harvest unit sizes that resulted from such adjustments in data. Other harvest units were enlarged somewhat to compensate for reduction in some units. A total of 358 acres were deleted in such actions and 418 acres were added. Records indicate that between January 1, 1981 and September 1, 1988 approximately 3,375 acres have been harvested. This indicates a net increase in acreage of approximately 2 percent.

Details on the units modified, their acreage, the reason for modification, and the resulting impacts are presented in Appendix A-2. No significant adverse environmental impacts resulted in Analysis Area 3 from these unit modifications, and a number of potential environmental impacts were avoided.



## Roads

Analysis Area 3 is linked to the inter-island transportation network of the Alaska Marine Highway System. It is possible to access Hoonah by car and Tenakee Springs by ATV from the ferry system. In addition to the established communities of Tenakee Springs and Hoonah, there are two logging camps in Analysis Area 3, one at Long Island and another at Kennel Creek. Both logging camps are connected by road to Hoonah and, therefore, to the Marine Highway System. Although timber harvest and related National Forest Management activities are the primary purposes for transportation development, there is considerable use of the road system for other activities.

Currently, there are about 180 miles of roads with an additional 21 miles to be built in 1989 in Analysis Area 3 (Table 3-5). Existing roads in VCUs 204 through 210, 215, and 217 through 219 link much of the Analysis Area to the Kennel Creek and Long Island LTFs and the Village of Hoonah. There is no road connection between the Hoonah road system and the Indian River road system, nor is one planned. There is also a short, isolated segment of road at Seal Creek on Freshwater Bay (VCUs 214 and 213).

**Table 3-5**  
**Existing Roads in Miles**

VCU	Existing Sept. 1, 1988	1989 Harvest Season	Total
203	0	0	0
204	15.8 <sup>1</sup>	0	15.8
205	13.0 <sup>1</sup>	0	13.0
206	13.5 <sup>1</sup>	0	13.5
207	20.5 <sup>1</sup>	0	20.5
208	4.5	0	4.5
209	19.5	0	19.5
210	16.8	5.0	21.8
211	0	0	0
212	0	7.7	7.7
213	1.0	0	1.0
214	0.6	6.5	7.1
215	15.9	0	15.9
216	7.9	0	7.9
217	9.1	0	9.1
218	28.0	0	28.0
219	1.8	0	1.8
220	12.5	0	12.5
221	0	0	0
Total	180.4	19.2	199.6

SOURCE: SEIS Planning Record.

<sup>1</sup> Existing road miles on non-Forest Service lands included.

## Log Transfer Facilities, Logging Camps, and Administrative Sites

There are four existing log transfer facilities in Analysis Area 3. The Long Island LTF was constructed in 1983 near Hoonah as a low-angle slide facility designed to skid log bundles directly into the water. This log transfer facility is currently in operation and will continue to be used under all of the alternatives.

The Kennel Creek LTF was constructed in 1976 on Freshwater Bay as a double A-frame facility with a timber bulkhead designed to allow low-velocity entry of logs into the water. The Kennel Creek LTF is currently in operation and will continue to be used under all of the alternatives, although the volume that would be transferred through this log transfer facility would vary depending on which alternative is selected.

A log transfer facility was constructed in 1989 at Seal Creek (VCU 213) in Freshwater Bay. An existing barge ramp, built to facilitate road construction in the Seal Creek Valley, was used to transfer logs from about 2 miles of road right-of-way. The permits that allowed construction of this low-angle slide facility are valid to January 18, 1991.

A fourth log transfer facility was constructed in 1989 at False Bay LTF. The permits that allowed construction of a low-angle slide facility at False Bay (VCU 210) are valid until late 1991.

There is an existing logging camp at Long Island. It is occupied year-round by approximately 150 to 160 persons consisting of about 55 families. An additional 85 people live there in a bunkhouse during the harvest season. The families are housed in mobile homes. Other facilities at the log camp include an office, shop, boat and plane docks, recreation hall, cook house, laundromat, commissary, playground, and a church. There is a church-operated school at the log camp with an enrollment of 13 children. The rest of the children at the log camp attend school in Hoonah. The population at the Long Island log camp does not fluctuate seasonally as much as is customary at other log camps in Southeastern Alaska because many of the people are year-round residents at the camp.

The logging camp at Kennel Creek on Freshwater Bay is occupied year-round by about 3 to 4



*Logs Being Sorted at the Long Island Log Transfer Facility.*

### 3 Affected Environment

families totaling approximately 12 people. During the harvest season, an additional 50 to 60 persons live at Kennel Creek. They are housed in mobile homes and one bunkhouse that can accommodate about 20 persons. Other facilities at the logging camp include a shop, airplane hangar, plane, and boat docks, helicopter fueling facility, and a gymnasium. There have not been enough children at Kennel Creek to keep the school open since 1985.

There will not be a logging camp associated with the Seal Creek LTF. Workers live in the existing Kennel Creek logging camp and cross Freshwater Bay by boat to access the Seal Creek LTF and associated harvest areas. Similarly, there is no logging camp planned for the False Bay area. Workers would live in Hoonah or the Long Island logging camp and access the False Bay LTF and harvest areas by road.

The Forest Service has not made any withdrawals of land for administrative sites in Analysis Area 3. However, administrative activities are conducted at several locations. The Hoonah Ranger District offices are located in the village of Hoonah on leased land. District office facilities include an office, warehouse, bunkhouse, four duplexes, and four double-wide mobile homes. Administrative activities associated with the logging camp at Long Island are conducted out of these district offices.

The Forest Service conducts administrative activities from a trailer with an attached building at the Kennel Creek logging camp. This trailer is only occupied during the harvest season.

Historically, the Forest Service has maintained a floating crewhouse in Whitestone Harbor (VCU 209). This crewhouse is moored in Hoonah during the winter. It will probably continue to be moored in Whitestone Harbor during the harvest season but there is always the possibility that it could be moved to another location in the National Forest should the need arise.

A small cabin on the Kennel Creek drainage (VCU 217) is used by the Forest Service for research purposes. A similar cabin near the Pavlof River (VCU 218) is also used for research and occasionally to house Forest Service field crews. A number of other cabins scattered throughout Analysis Area 3 have recently been dismantled.



## Wildlife

Alaska's fish and wildlife are valuable for aesthetic, economic, recreational, and subsistence purposes. Visitors come from all over the world to view bald eagles, spawning salmon, mountain goats, humpback whales, and other wildlife species in Southeast Alaska. Over 300 species of birds, fish, and mammals occur in the Tongass National Forest.

Many wildlife species exist within the Contract area and occupy a diverse range of habitats. However, not all the species that occur in the Contract area will be affected by the proposed actions or alternatives. Therefore, to identify effects on wildlife, several types of studies and inventories have been conducted.

Wildlife habitats were identified in the Analysis Area. Habitat refers to the kind of environment in which a species occurs. This environment can be described in physical or biological terms, which often includes elevation, topographic position, or type of vegetation community. A species may occupy a range of different habitats, or more than one distinctive kind of habitat in different seasons. Habitats identified in previous forest management plans and used in this document include: old growth, forested, deer winter range, inland wetland, beach fringe, estuarine fringe, and streamside riparian. An acreage inventory of each habitat by VCU is included below in the Emphasis Habitats section.

Several wildlife species that use those habitats were identified for additional evaluation. These animals were named emphasis species due to their importance in the overall area, both to the ecosystem and humans. The emphasis species selected for this analysis were identified during development of the 1986-90 APC Contract Area Plan. The species selected include: Sitka black-tailed deer, brown bear, pine marten, land otter, bald eagle, and Vancouver Canada goose.

Information obtained from the habitat inventory, literature review, and resource agency records provided the basis for an emphasis species evaluation. The Sitka black-tailed deer, brown bear, and pine marten evaluations included use of a habitat capability model. The models use biological and habitat information unique for each species to estimate the capability of a given habitat to support a population. Information provided by each model allows land managers and resource agency personnel to evaluate existing habitat capabilities and predict the relative effects of a proposed land management activity.

## Wildlife Habitats

Several types of wildlife habitat (the Emphasis Habitats) were inventoried and analyzed in the APC 1981-86 and 1986-90 FEISs. Two noninventoried habitats discussed in the FEISs include alpine/subalpine and old growth.

Subalpine habitat is the upper edge of forested areas (within 1,000 feet) adjoining alpine areas. This habitat is important summer range for deer and bear. Alpine/subalpine habitat is not included in this analysis because timber is not harvested there, and it would be essentially unaffected during the 1986-90 Operating Period.

Certain wildlife such as Sitka black-tailed deer are reported to be old-growth dependent species. Therefore, to recognize its importance, old-growth habitat was introduced in the 1986-90 FEIS as a management prescription. Further discussion of old-growth habitat characteristics is included below. The prescribed management acreage and effects of the proposed harvest alternatives can be found in Chapter 4.

Forested habitat includes all areas with forest cover. All other habitats evaluated in this EIS are located within the forested habitat. Many wildlife species, including those associated with old growth, make use of all forested areas within the study area. Therefore, while the other habitats have been delineated because of specific attributes or management concerns, the forested habitat is presented to disclose general overall effects on carrying capacity for old-growth dependent species (Forest Service 1986b, pp. 3-22 and 3-23).

Table 3-6 shows the forested habitat acres that existed prior to timber harvest activities, acres harvested to September 1, 1988, and acres remaining after 1988. Forested habitat information on National Forest, Native Corporation, and Tenakee Springs lands is included to provide a basis for the evaluation of impacts over the entire analysis area.

### Emphasis Habitats

Emphasis habitats inventoried since the Tongass Land Management Plan for Analysis Area 3 include deer winter range, inland wetland, beach fringe, estuarine fringe, and streamside riparian. The inventory was predominantly obtained from mylar maps developed during the analysis for the EIS for the original TLMP and the 1986-90 Operating Period. Mylar maps were prepared with the help of topographical maps and aerial photos. Emphasis habitat acres on Native Corporation lands are not included because similar inventory data or the precise location of harvest units is not available.

Tongass Land Management Plan data were used for VCUs 205, 207, 220, and 221 because wildlife inventories were not completed for the 1986-90 FEIS analysis since no timber harvest was planned for these VCUs. The Tongass Land Management Plan data were collected in a similar, but not identical, manner as the 1986-90 FEIS inventories and are used where 1986-90 FEIS inventory data are not available.

Table 3-7 lists the estimated amount of wildlife habitat prior to any timber harvest. If the 1986-90 habitat mylars indicated a particular habitat (for example, deer winter range) is present on either side of an existing clearcut unit, the acreage of the clearcut unit was assumed to have been deer winter range and added into the total for deer winter range presented in the table. The data in Table 3-7 are used as a baseline for calculating the amount of habitat converted to second-growth timber management. It is important to recognize that when trees are harvested

### 3 Affected Environment

Table 3-6

#### Timber Harvest of Forested Habitat on National Forest and Private Lands

VCU	Forested Habitat <sup>1</sup>	Harvested to 1989	Remaining After 1989
<i>Acres</i>			
203	8,894	0	8,894
204 <sup>2</sup>	30,386	432	29,954
205 <sup>2</sup>	9,465	1,938	7,527
206 <sup>3</sup>	4,450	1,108	3,342
207 <sup>2</sup>	18,190	2,777	15,413
208 <sup>2</sup>	5,698	125	5,573
209	10,945	1,854	9,091
210	10,664	1,120	9,544
211	4,002	0	4,002
212	9,754	197	9,557
213	2,966	0	2,966
214	3,818	209	3,609
215	18,670	1,602	17,068
216	6,796	487	6,309
217	8,814	1,201	7,613
218	15,072	1,804	13,268
219 <sup>4</sup>	5,551	326	5,225
220 <sup>4</sup>	13,696	1,244	12,452
221 <sup>4</sup>	4,278	245	4033
Total	192,109	16,669	175,440

(Continued)

from a habitat, a habitat still exists. However, it is converted to second-growth timber management and does not have the same habitat value or conditions that previously existed.

Table 3-8 shows the amount of timber in wildlife habitats that was previously harvested through September 1, 1988. This includes logging that occurred under the Long-Term Timber Sale Contract and earlier clearcut logging that has occurred primarily since the 1950s, although some harvesting took place as early as 1918. Generally, less than 10 percent of the habitats in each VCU had timber harvested. Notable exceptions include VCU 203 where 20 percent of the deer winter range and 29 percent of the beach fringe habitats were harvested. In addition, the following VCUs exceed 10 percent harvest of the emphasis habitats. VCU 204 includes harvest of 15 percent deer winter range and 12 percent beach fringe; VCU 209, 15 percent deer winter range, 31 percent beach fringe, and 24 percent streamside riparian; VCU 213, 45 percent streamside riparian; VCU 215, 16 percent deer winter range; VCU 217, 35 percent streamside riparian; VCU 218, 14 percent inland wetland; VCU 219, 50 percent streamside riparian; and VCU 221, 34 percent streamside riparian. Of the forested habitat, which includes all commercial forest land, 12 percent has been harvested in VCU 209 and 14 percent in VCU 217.

Table 3-6 (Continued)

**Timber Harvest of Forested Habitat on National Forest and Private Lands**

VCU	Forested Habitat <sup>1</sup>	Harvested to 1989	Remaining After 1989
<i>Percent</i>			
203		0	100
204 <sup>2</sup>		1	99
205 <sup>2</sup>		21	79
206 <sup>3</sup>		25	75
207 <sup>2</sup>		15	85
208 <sup>2</sup>		2	98
209		17	83
210		10	90
211		0	100
212		2	98
213		0	100
214		5	95
215		9	91
216		7	93
217		14	86
218		12	88
219 <sup>4</sup>		6	94
220 <sup>4</sup>		9	91
221 <sup>4</sup>		6	94
Total <sup>5</sup>		9	91

SOURCE: 1986-90 FEIS (Forest Service 1986b) and SEIS Planning Record.

<sup>1</sup> Existing acres of forested habitat prior to recorded timber harvest.

<sup>2</sup> Both National Forest and Native Corporation lands are present in the VCU.

<sup>3</sup> Only Native Corporation land is present in the VCU.

<sup>4</sup> Both National Forest and Private lands are present in the VCU.

<sup>5</sup> This value represents the percent of pre-harvest habitat in the entire Analysis Area.

It is important to recognize that a significant amount of the past impacts to wildlife habitat occurred many years ago during the days of A-frame logging along the coastline. For example: 65 acres of harvest in estuarine fringe and 489 acres of beach fringe took place prior to 1975. In deer winter range, 1048 acres were harvested prior to 1975, with 417 harvested acres since 1975.

Table 3-9 shows the acreage and percentage of each habitat that remained following Court-authorized harvest activities through September 1, 1988. In many cases, at least 70 percent of the habitats remain, and in some cases 100 percent remain in a VCU. The percent of habitats remaining through 1988 reflects only authorized harvest activities and does not include currently proposed actions (Phase I-Draft SEIS Alternatives, Forest Service 1988a).

### 3 Affected Environment

Table 3-7

#### Existing Acres of Wildlife Habitat Prior to Recorded Timber Harvest

VCU	Forested	Deer Winter Range	Inland Wetland	Beach Fringe	Estuarine Fringe	Streamside Riparian
<i>National Forest Land</i>						
203	8,894	703	0	298	268	311
204	25,630	1,099	0	678	238	1,941
205 <sup>1</sup>	3,401	0	0	0	0	0
207 <sup>1</sup>	8,057	0	25	0	0	300
208	5,566	638	13	502	0	0
209	10,945	1,229	0	465	406	557
210	10,664	1,962	0	669	150	707
211	4,002	748	0	560	0	0
212	9,754	768	24	255	90	410
213	2,966	1,410	38	1,095	0	76
214	3,818	256	0	109	86	79
215	18,670	2,645	32	836	823	704
216	6,796	0	0	0	0	0
217	8,814	1,372	0	480	49	455
218	15,072	1,321	160	560	552	917
219	4,945	1,113	0	419	0	50
220 <sup>1</sup>	11,749	0	21	0	270	1,709
221 <sup>1</sup>	<u>3,941</u>	<u>1,160</u>	<u>15</u>	<u>665</u>	<u>0</u>	<u>91</u>
Subtotal	163,684	16,424	328	7,591	2,932	8,307
<i>Native Corporation Land</i>						
204	4,756					
205	6,064					
206	4,450					
207	10,133					
208	<u>132</u>					
Subtotal	25,535					
<i>Tenakee Springs and State of Alaska Land</i>						
219	606					
220	1,947					
221	<u>337</u>					
Subtotal	2,890					
Total	192,109					

SOURCE: Tongass Land Management Plan (Forest Service 1986d) and SEIS Planning Record.

<sup>1</sup> Tongass Land Management Plan data is used since subsequent wildlife inventories have not been completed for the VCUs that are not scheduled for timber harvest. The Tongass Land Management Plan data were collected in a similar, but not exactly the same manner as the subsequent wildlife inventory data.

Table 3-8

**Acres of Wildlife Habitat Harvested to September 1, 1988**

VCU	Forested	Deer Winter Range	Inland Wetland	Beach Fringe	Estuarine Fringe	Streamside Riparian
<i>National Forest Land</i>						
203	138	138	— <sup>1</sup>	87	0	0
204	432	159	— <sup>1</sup>	84	12	56
205	0	— <sup>1</sup>	— <sup>1</sup>	— <sup>1</sup>	— <sup>1</sup>	— <sup>1</sup>
207	0	— <sup>1</sup>	0	— <sup>1</sup>	— <sup>1</sup>	0
208	46	0	0	0	— <sup>1</sup>	— <sup>1</sup>
209	1,304	181	— <sup>1</sup>	210	4	170
210	0	0	— <sup>1</sup>	0	4	5
211	0	0	— <sup>1</sup>	0	— <sup>1</sup>	— <sup>1</sup>
212	0	0	0	0	0	0
213	0	101	0	9	— <sup>1</sup>	34
214	0	0	— <sup>1</sup>	0	0	0
215	1,298	428	2	23	42	57
216	487	— <sup>1</sup>	— <sup>1</sup>	— <sup>1</sup>	— <sup>1</sup>	— <sup>1</sup>
217	1,201	118	— <sup>1</sup>	1	3	158
218	1,551	180	30	0	0	53
219	246	60	— <sup>1</sup>	25	— <sup>1</sup>	25
220	796	— <sup>1</sup>	0	— <sup>1</sup>	0	0
221	245	100	0	50	— <sup>1</sup>	31
Subtotal	7,744	1,465	32	489	65	589
<i>Native Corporation Land</i>						
204	0					
205	1,938					
206	1,108					
207	2,777					
208	35					
Subtotal	5,858					
<i>Tenakee Springs and State of Alaska Land</i>						
219	80					
220	448					
221	0					
Subtotal	528					
Total	14,130					

(Continued)

### 3 Affected Environment

Table 3-8 (Continued)

#### Percentage of Wildlife Habitat Harvested to September 1, 1988

VCU	Forested	Deer Winter Range	Inland Wetland	Beach Fringe	Estuarine Fringe	Streamside Riparian
<i>National Forest Land</i>						
203	2	20	— <sup>1</sup>	30	0	0
204	2	15	— <sup>1</sup>	12	1	3
205	0	— <sup>1</sup>	— <sup>1</sup>	— <sup>1</sup>	— <sup>1</sup>	— <sup>1</sup>
207	0	— <sup>1</sup>	0	— <sup>1</sup>	— <sup>1</sup>	0
208	1	0	0	0	— <sup>1</sup>	— <sup>1</sup>
209	12	15	— <sup>1</sup>	45	1	31
210	0	0	— <sup>1</sup>	0	3	1
211	0	0	— <sup>1</sup>	0	— <sup>1</sup>	— <sup>1</sup>
212	0	0	0	0	0	0
213	0	7	0	1	— <sup>1</sup>	45
214	0	0	— <sup>1</sup>	0	0	0
215	7	16	6	3	5	8
216	7	— <sup>1</sup>	— <sup>1</sup>	— <sup>1</sup>	— <sup>1</sup>	— <sup>1</sup>
217	14	9	— <sup>1</sup>	1	6	35
218	10	14	14	0	0	6
219	5	5	— <sup>1</sup>	6	— <sup>1</sup>	50
220	7	— <sup>1</sup>	0	— <sup>1</sup>	0	0
221	— <u>6</u>	— <u>9</u>	— <u>0</u>	— <u>8</u>	— <sup>1</sup>	— <u>34</u>
Subtotal	5	9	10	6	2	7
<i>Native Corporation Land</i>						
204	0					
205	32					
206	25					
207	27					
208	— <u>27</u>					
Subtotal	23					
<i>Tenakee Springs and State of Alaska Land</i>						
219	13					
220	23					
221	— <u>0</u>					
Subtotal	18					
Total <sup>2</sup>	7					

SOURCE: SEIS Planning Record.

<sup>1</sup> None of this habitat was found in the inventory.

<sup>2</sup> This value represents the percent of pre-harvest habitat affected in the entire Analysis Area.

Table 3-9

**Acres of Wildlife Habitat Remaining After September 1, 1988**

VCU	Forested	Deer Winter Range	Inland Wetland	Beach Fringe	Estuarine Fringe	Streamside Riparian
<i>National Forest Land</i>						
203	8,756	565	— <sup>1</sup>	211	268	311
204	25,198	940	— <sup>1</sup>	594	226	1,885
205	3,401	— <sup>1</sup>	— <sup>1</sup>	— <sup>1</sup>	— <sup>1</sup>	— <sup>1</sup>
207	8,057	— <sup>1</sup>	25	— <sup>1</sup>	— <sup>1</sup>	300
208	5,520	638	13	502	— <sup>1</sup>	— <sup>1</sup>
209	9,641	1,048	— <sup>1</sup>	255	402	387
210	10,664	1,962	— <sup>1</sup>	669	146	702
211	4,002	748	— <sup>1</sup>	560	— <sup>1</sup>	— <sup>1</sup>
212	9,754	768	24	255	90	410
213	2,966	1,309	38	1,086	— <sup>1</sup>	42
214	3,818	256	— <sup>1</sup>	109	86	79
215	17,372	2,217	30	813	781	647
216	6,309	— <sup>1</sup>	— <sup>1</sup>	— <sup>1</sup>	— <sup>1</sup>	— <sup>1</sup>
217	7,613	1,254	— <sup>1</sup>	479	46	297
218	13,521	1,141	130	560	552	864
219	4,699	1,053	— <sup>1</sup>	394	— <sup>1</sup>	25
220	10,953	— <sup>1</sup>	21	— <sup>1</sup>	270	1,709
221	<u>3,696</u>	<u>1,060</u>	<u>15</u>	<u>615</u>	<u>—<sup>1</sup></u>	<u>60</u>
Subtotal	155,940	14,959	296	7,102	2,867	7,718
<i>Native Corporation Land</i>						
204	4,756					
205	4,126					
206	3,342					
207	7,356					
208	<u>97</u>					
Subtotal	19,677					
<i>Tenakee Springs and State of Alaska Land</i>						
219	526					
220	1,499					
221	<u>337</u>					
Subtotal	2,362					
Total	177,979					

(Continued)

### 3 Affected Environment

Table 3-9 (Continued)

#### Percentage of Wildlife Habitat Remaining After September 1, 1988

VCU	Forested	Deer Winter Range	Inland Wetland	Beach Fringe	Estuarine Fringe	Streamside Riparian
<i>National Forest Land</i>						
203	98	80	— <sup>1</sup>	71	100	100
204	98	85	— <sup>1</sup>	88	95	97
205	100	— <sup>1</sup>	— <sup>1</sup>	— <sup>1</sup>	— <sup>1</sup>	— <sup>1</sup>
207	100	— <sup>1</sup>	100	— <sup>1</sup>	— <sup>1</sup>	100
208	99	100	100	100	— <sup>1</sup>	— <sup>1</sup>
209	88	85	— <sup>1</sup>	55	99	69
210	100	100	— <sup>1</sup>	100	97	99
211	100	100	— <sup>1</sup>	100	— <sup>1</sup>	— <sup>1</sup>
212	100	100	100	100	100	100
213	100	93	100	99	— <sup>1</sup>	55
214	100	100	— <sup>1</sup>	100	100	100
215	93	84	94	99	95	92
216	93	— <sup>1</sup>	— <sup>1</sup>	— <sup>1</sup>	— <sup>1</sup>	— <sup>1</sup>
217	86	91	— <sup>1</sup>	99	94	65
218	90	86	81	100	100	94
219	95	95	— <sup>1</sup>	94	— <sup>1</sup>	50
220	93	— <sup>1</sup>	100	— <sup>1</sup>	100	100
221	94	91	100	92	— <sup>1</sup>	66
Subtotal	95	91	90	94	98	93
<i>Native Corporation Land</i>						
204	100					
205	68					
206	75					
207	73					
208	73					
Subtotal	77					
<i>Tenakee Springs and State of Alaska Land</i>						
219	87					
220	77					
221	100					
Subtotal	82					
Total <sup>2</sup>	93					

SOURCE: SEIS Planning Record.

<sup>1</sup> None of this habitat was found in the inventory.

<sup>2</sup> This value represents the percent of pre-harvest habitat remaining in the entire Analysis Area.

### Deer Winter Range

The limiting factor for Sitka black-tailed deer carrying capacity is deer winter range. The attributes of low-elevation old-growth stands that constitute deer winter range have been documented by Wallmo and Schoen (1980). Those attributes include proper canopy cover, understory, slope, aspect, distance to saltwater, and elevation. Though an array of habitat choices is available in Southeast Alaska, these habitats vary in their ability to meet the changing seasonal requirements of the deer. During the summer and early fall, deer in Southeast Alaska use habitats that include clearcuts, alpine, and low- and high-volume old-growth forest. Throughout winter and early spring, however, deer use old growth almost exclusively (Schoen et al. 1985). Schoen further indicates that during winters with deep snow, deer prefer high-volume old growth over all other habitats.

A study conducted on Vancouver Island (McNay and Doyle 1987) indicated that black-tailed deer habitat use varied depending on seasonal movement behavior. Conclusions reached in this study might apply to Southeast Alaska, because habitats on Vancouver Island are representative of a coastal environment. Radio-collared deer were studied over five years to identify seasonal movement strategies and winter habitat selection. Movement strategies were divided into migrants and nonmigrants (residents). Seasonal home ranges of migratory deer were found to be significantly larger than those of resident deer and they tended to use all habitat types within their respective home ranges. Most resident deer were found to use only the pole-sapling habitats within the Douglas-fir conifer type.

McNay and Doyle (1987) also found that habitat use during specific winter weather conditions varied depending on weather severity. During heavy snow accumulation and cold temperatures most deer reduced their home range size and were forced to seek out the closest forested habitat. Home range sizes became more variable and most deer tended to prefer early successional habitats during mild weather. Both migrating and resident deer used all habitats available to them within the boundaries of their seasonal home ranges. Individual deer appeared to be relatively inflexible in their responses to habitat changes: resident deer being the least capable of dealing with catastrophe. Because migrating deer use a greater diversity of habitats within a larger home range, they appeared to be more capable of dealing with extreme conditions. It is arguable that the McNay and Doyle (1987) findings, in total or in part, have direct applicability to the environment in Analysis Area 3.

Deer winter range is essential to deer under severe or moderately severe winter conditions. Severe winters are described as sea level snow accumulations exceeding 30 centimeters (11.8

### Deer Winter Range



### **3 Affected Environment**

inches) for four or more months (Hanley, et. al. 1984). In severe winters, deer are confined to winter range habitat where it is available, or are forced to the beach fringe. Their movements are then restrained by deep and persistent snowpack; food plants become harder to obtain and available plants are overbrowsed; and in some years, large numbers of deer die (Forest Service 1986b, p. 3-21).

Moderately severe winters are those where snow accumulations range from 10 to 30 centimeters (3.9 to 11.8 inches) for four or more months. In moderately severe winters, deer require the use of winter range habitat, but most of the time they can move about within the habitat area. Sufficient food plants are available for all or most of the deer to survive. Under moderately severe winter conditions, habitat quality and abundance are the key to survival for deer (Forest Service 1986b, p. 3-21).

There have been three severe and two moderately severe winters since 1969. The three severe winters were between 1969 and 1973 and were considered to be the cause of the major deer population declines throughout Southeast Alaska. Relatively mild winters since then have allowed most deer populations throughout the APC Contract area to rebound to previous high levels.

In 1982, the Forest Service appointed an internal Task Force to define habitat that is considered Sitka black-tailed deer winter range. The Task Force included individuals from the Wildlife, Watershed, and Timber Management Departments. Further input from Alaska Department of Fish and Game along with several research papers provided the basis for a procedure to identify and inventory those habitats (Schoen 1978, Schoen, et al. 1979, 1981, Forest Service 1986f). The final delineation and ranking of deer winter range was based on both vegetation and physical parameters. Physical parameters included elevation and distance from saltwater. Vegetation parameters in two categories included stand type that influenced snow interception and stand type relating to forage needs.

Table 3-9 indicates that timber harvest activities authorized through September 1, 1988 had little impact on a high percentage of deer winter range in most VCUs. The percentage of remaining habitat spans from a low of 80 percent in VCU 203 to 100 percent in five VCUs. Four of the VCUs have greater than 90 percent remaining deer winter range. Approximately 16,400 acres of deer winter range existed prior to any recorded harvest activities. Of that, approximately 15,000 acres or 91 percent has not been impacted by harvest activities through September 1, 1988.

#### **Inland Wetland**

These areas are not necessarily wetlands as defined by the US Fish and Wildlife Service (Cowardin, et al. 1979). Rather, inland wetland habitat is defined as forested areas within 500 feet of low elevation lakes, beaver ponds, marshlands, and associated grass/sedge meadows that are larger than 10 acres. These sites are especially important for bears, furbearers, certain waterfowl, and a variety of other birds. Areas inventoried for the inland wetland habitat did not include many small wetland areas that account for much of the existing wetland acreage.

Table 3-7 indicates approximately 330 acres of inland wetland habitat existed in Analysis Area 3 prior to any recorded timber harvest. Of that total, approximately 300 acres or 90 percent remained unaffected by harvest activities through September 1, 1988 (Table 3-9).

#### **Beach Fringe**

Forested areas within 600 feet of the ocean are transition zones between land and water, salt and freshwater, and vegetated and nonvegetated conditions (Forest Service 1979b). Forested areas in this transition zone receive heavy use by species with high economic, recreational, subsistence, or aesthetic values. Brown bear, river otter, bald eagle, pine marten, black-tailed deer, and Vancouver Canada goose are typical species that concentrate their activities during some or all seasons in these forest stands. Many of these species exhibit a preference for, or dependence on, mature/overmature forest stands.



*Inland Wetland Habitat*

Table 3-7 indicates approximately 7,600 acres of beach fringe habitat existed in Analysis Area 3 prior to any recorded timber harvest. Of that total, approximately 7,100 acres or 94 percent remained unaffected by harvest activities through September 1, 1988 (Table 3-9).

#### **Estuarine Fringe**

Bears, waterfowl, furbearers, and bald eagles are all primary users of the estuarine fringe habitat. Although timber harvest activities have been minimal within the actual estuarine habitat, it is the timbered zone bordering estuarine habitat that is evaluated here. A 1,000-foot timbered zone around estuarine areas was identified in the Tongass Land Management Plan Wildlife Task Force Working Report (Forest Service 1979b) and was used in the 1986-90 FEIS (Forest Service 1986b, p. 3-22) to quantify alteration of habitat. The forested estuarine fringe is similar to beach fringe, but due to species diversity it has a greater value to wildlife; especially brown bears, river otters, bald eagles, and waterfowl.

Table 3-7 indicates approximately 2,950 acres of estuarine fringe habitat existed in Analysis Area 3 prior to any recorded timber harvest. Of that total, approximately 2,900 acres, or 98 percent, remained unaffected by harvest activities through September 1, 1988 (Table 3-9).

#### **Streamside Riparian**

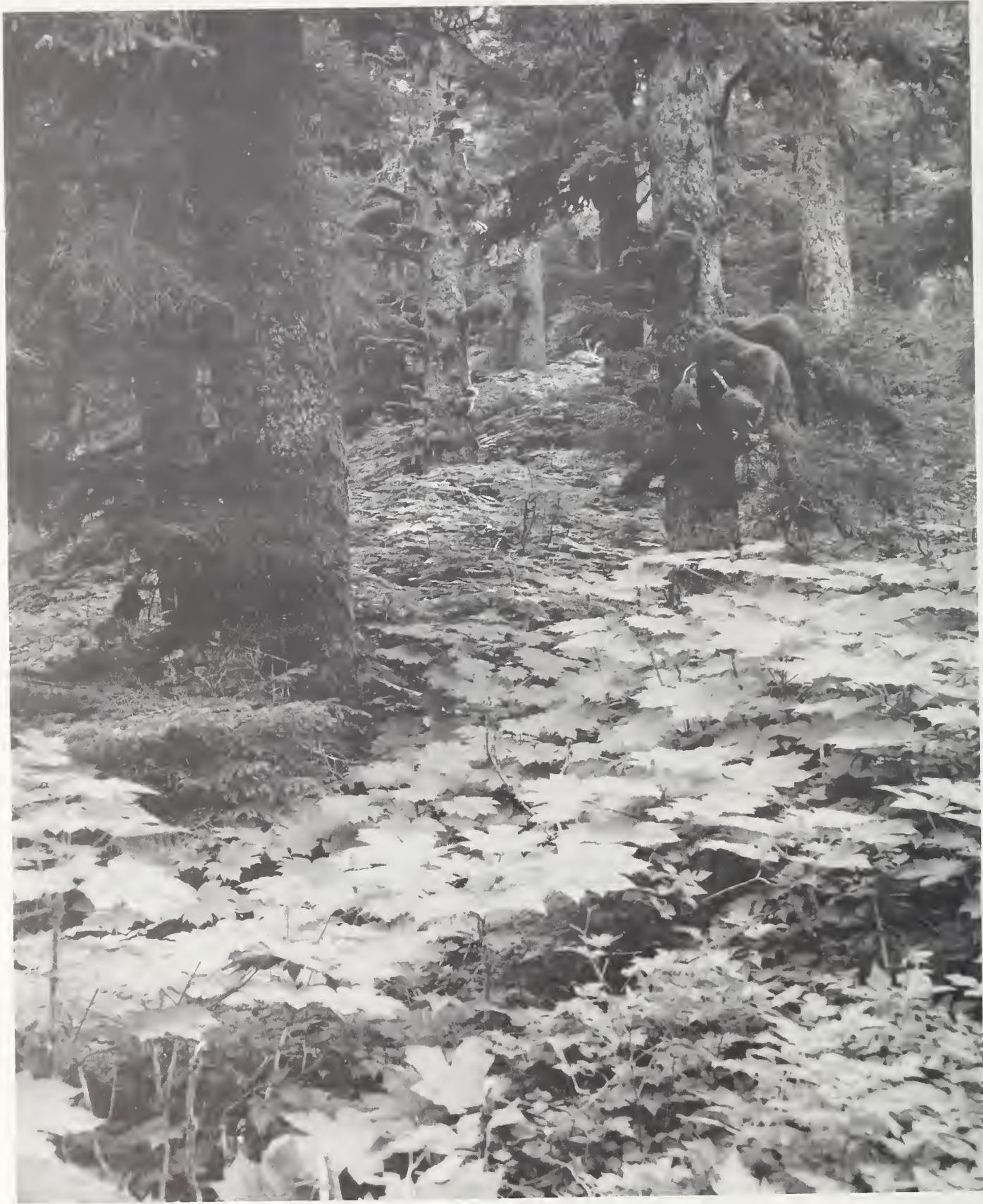
Forested areas within 500 feet of anadromous salmon spawning areas, as recommended in the Tongass Land Management Plan Wildlife Task Force Working Report (Forest Service 1979b), are called streamside riparian habitat zones. These areas are used primarily by eagles, fur-bearers, and brown bears (Forest Service 1986b, p. 3-22).

Table 3-7 indicates approximately 8,300 acres of streamside riparian habitat existed in Analysis Area 3 prior to any recorded timber harvest. Of that total, approximately 7,700 acres, or 93 percent, remained unaffected by harvest activities through September 1, 1988 (Table 3-9).

#### **Old-Growth Forest**

Much of the forest in Analysis Area 3 can be considered old growth since it has been largely unaffected by timber harvest, windthrow or fires. This habitat type is characterized as stands of trees usually well past the age of maturity, with declining growth rates and signs of decadence,

### 3 Affected Environment



*Streamside Riparian Habitat*

such as dead and dying trees, snags, and downed woody material. The stand usually includes large diameter trees, multi-layered canopies, a range of tree diameter sizes, and the notable presence of understory vegetation. These forests are in a dynamic, steady-state where the death of old trees is balanced by the growth of new trees.

Old-growth forests have broken, multilayered canopies through which sunlight penetrates to the forest floor. The forest floor is typically carpeted by an abundance of ferns, mosses, herbs, and shrubs. Lichens and fungi add to the diversity, as do standing snags and decaying logs, both on the ground and in streams. Seedlings, saplings, and pole-sized trees grow in the scattered openings that are created as large old trees die and fall to the forest floor. Trees of all ages occur in such stands, and the ages of dominant trees exceed 300 years. In some stands the oldest trees are more than 800 years old, 3 meters in diameter, and 60 meters in height.

Wildlife habitat management units identified on maps in the Phase I Draft SEIS (Forest Service 1988a, Figures 4-24 to 4-35) show the location of habitat important to old-growth dependent species. The maps do not display all old-growth habitat, nor do they display all wildlife habitats that occur in the study area. Old-growth habitat was mapped in conjunction with deer winter range, around concentrations of eagle nest trees, and near the mouths of streams. These areas include most deer winter range and estuarine fringe, along with some beach fringe.

Old-growth habitat was not inventoried for the Tongass Land Management Plan, but was addressed by prescription in the 1986-90 FEIS. Wildlife management units were defined where no harvest or related activities would be applied during the 1986-90 Operating Period. The "no harvest" prescription would remain in effect unless the stated management direction was modified after further environmental analysis and public disclosure. Prescribed acreages for old-growth conditions on National Forest land, as identified in the Phase I Draft SEIS are shown in Table 4-17 (Chapter 4) along with the proposed harvest alternatives.

## Wildlife Species

In addition to identifying wildlife habitats, specific animals known as emphasis species were selected for further evaluation. A species can be termed as an emphasis species for a variety of reasons. They may be threatened or endangered animals identified on state or federal lists. They may also include species commonly hunted, fished or trapped, or nongame species of special interest. Additionally, they usually include species that may be affected by the planned management programs under consideration. The discussion and analysis of each emphasis species includes a general description and, where available, information on harvest activities and habitat capability.

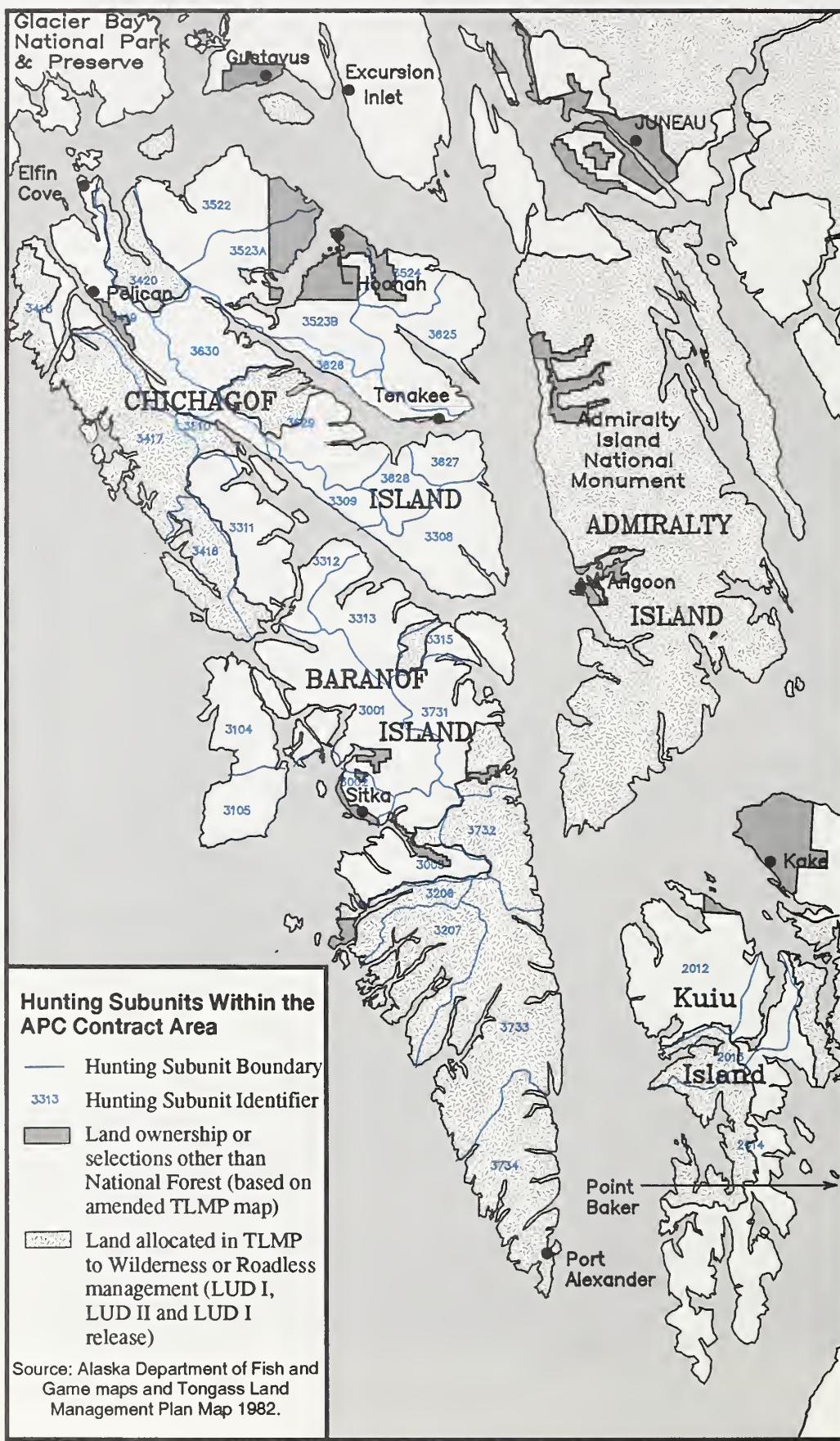
The human use of wildlife emphasizes many of the prominent reasons why certain wildlife species are important. Records of human use, maintained as tools for managing populations, may also provide information on population trends that can be useful in analyzing impacts of various actions. Most of these statistics are also important in describing and evaluating subsistence issues and recreational issues.

The Alaska Department of Fish and Game subdivides all land areas into Game Management Units. These boundaries provide the basis for managing the various wildlife populations under their jurisdiction. Much of the data collection concerning population density estimates originates from hunting permits and inventory work associated with the Game Management Units. Each Game Management Unit is further subdivided into Major Harvest Areas and Minor Harvest Areas.

Figure 3-2 shows that Analysis Area 3 contains Major Harvest Areas 35 and 36. Within Major Harvest Area 35 there are two Minor Harvest Areas that include Area 3524 and half of Area 3523. Within Major Harvest Area 36 there are Minor Harvest Areas 3625 and 3626. Information provided below on emphasis species harvest is labeled by respective Major and Minor Harvest Areas. For additional information, the reader is referred to the Subsistence and Recreation sections of this EIS.

### 3 Affected Environment

Figure 3-2



Information obtained from the habitat inventory and the biology of the emphasis species is worked into a habitat capability model. Habitat capability models are used to assist in the evaluation of effects of proposed land management activities on wildlife habitats and populations. The objective of each model is to estimate the capability of habitats in the study area to support populations of the selected emphasis species. Data collection on factors such as snow conditions, timber volume classes, physiographic features, predation, and clearcut size provide the values used to evaluate habitat capability. Species models were used to evaluate habitat capability for the Sitka black-tailed deer, brown bear, and pine marten (Forest Service 1988c, 1989a). The information obtained from those models is provided below under the respective emphasis species. Habitat capability information is included for these species on National Forest, Tenakee Springs, and Native Corporation lands.

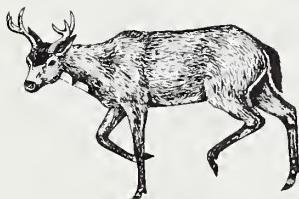
The development of a species model involves an extensive process of biological and literature research by a team of recognized experts. Team members are selected from a variety of sources including the Alaska Department of Fish and Game, Forest Service, US Fish and Wildlife Service, and land management agencies. After a draft model is prepared, it is thoroughly reviewed by fish and wildlife agency biologists. The model review and verification process allows a consensus among the various interests and lends credibility for its use as a management tool.

It is important to note that these models are used as a tool for management decisions. They should be recognized as only one of several sources in the overall process to identify specific project effects. Knowledge concerning each species and their various habitat needs improves through time and adds to the reliability of modeling predictions.

### Emphasis Species

The study of emphasis species is done to determine the effects of resource management activities on these important species and their habitats. Also, because the selected species may reflect the viability of a particular habitat, information is gained for the other animals that use the same habitat. The degree to which predicted impacts for these species can be extrapolated to a larger segment of the wildlife community depends on careful species selection.

#### Sitka Black-tailed Deer



*Sitka Black-tailed Deer*

The Sitka black-tailed deer of Southeast Alaska are more abundant on coastal islands than on the mainland (Wallmo and Schoen 1980). The Sitka black-tailed deer ranges through all major habitats in the APC Contract area. They rely heavily on forested habitats for cover, and much of their feeding is in forested areas. In summer, these deer range through all elevations, including alpine meadows and subalpine forests. They also feed in clearcuts where forage is plentiful. Winter snows drive them to lower elevations, and deep snow forces them to the beach fringe (Forest Service 1986b, p. 3-21). They may even feed on seaweed at low tide when most of their preferred browse is unavailable. They are prized for recreational and subsistence hunting in Southeast Alaska.

Black-tailed deer consume nearly 60 species of plants throughout their geographic range (Forest Service 1989a). The preferred winter forage of Sitka black-tailed deer is succulent evergreen half-shrubs and forbs, including bunchberry dogwood, five-leaved bramble, gold thread, foamflower, and pyrola (Schoen and Wallmo 1979). As snow accumulates at high elevations and covers these preferred forage species, deer will move downslope. When these preferred plants are covered with snow throughout the deer winter range, they rely primarily on various huckleberry shrubs.

Arboreal lichens are also a preferred winter food in overmature forests. The presence or absence of lichens in the diet of deer apparently reflects availability. Lichens provide large amounts of energy and may enhance the digestibility of other food items (Rochelle 1980). Lichens are a particularly important source of energy for deer during intermediate to heavy snow winters because they are available as litterfall on top of the snow.

### **3 Affected Environment**

The value of habitat for deer, under varying weather conditions, is directly related to the composition, structure, and productivity of vegetation on a site (Harestad 1985). During low snow conditions, when habitat selection by deer is not significantly influenced by snow, deer will select those habitats that provide the best foraging opportunities. Under intermediate and deep snow conditions, deer will select those habitats that provide for snow interception and food availability. The combination of a dense canopy with scattered openings in old-growth forests allows forage growth under openings while the canopy modifies snowfall sufficiently to promote forage availability and movement of deer.

ADF&G reports that deer population numbers are at a high level in Major Harvest Areas 35 and 36. These harvest areas include Analysis Areas 2, 3, and part of 6. Within the Major Harvest Areas the number of deer harvested (Table 3-10), the number of deer hunter days (Table 3-11), and the number of deer hunters (Table 3-12) more than doubled between 1984 and 1987. During 1988, ADF&G redrew the boundaries for both Major and Minor Harvest Areas 35 and 36 (Figure 3-3 and Table 3-13). Therefore the harvest data for 1988 is not directly

Table 3-10

#### **Number of Sitka Black-tailed Deer Harvested**

Year	Major Harvest Area	
	35	36
1984	807	635
1985	1,165	724
1986	1,820	935
1987	1,861	1,295

SOURCE: ADF&G Annual Hunting and Trapping Reports, Juneau, AK.

Table 3-11

#### **Number of Deer Hunter Days**

Year	Major Harvest Area	
	35	36
1985	2,257	1,574
1986	5,667	2,914
1987	6,407	3,703

SOURCE: ADF&G Annual Hunting and Trapping Reports, Juneau, AK.

Table 3-12

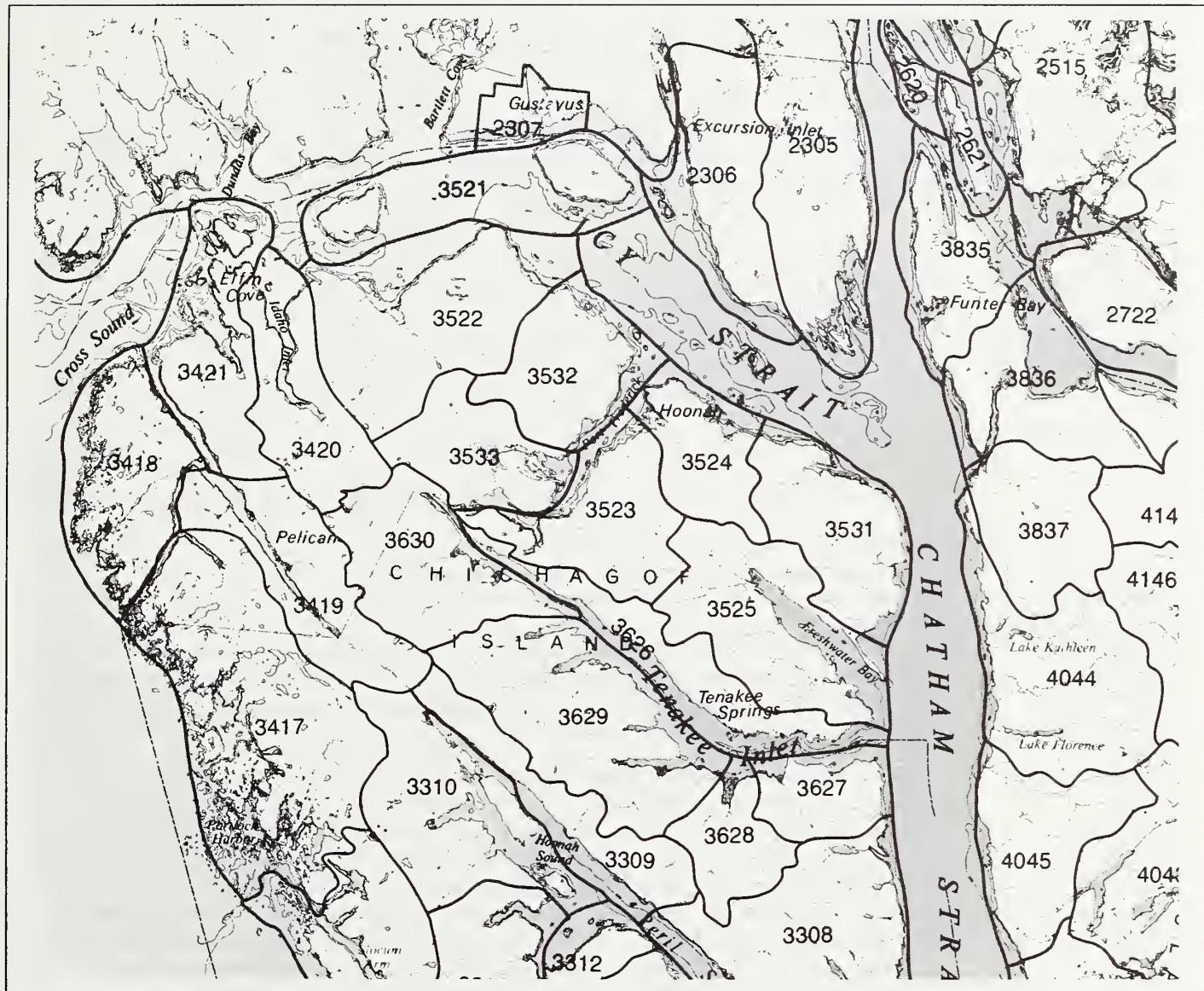
#### **Number of Deer Hunters**

Year	Major Harvest Area	
	35	36
1985	546	389
1986	941	516
1987	903	634

SOURCE: ADF&G Annual Hunting and Trapping Reports, Juneau, AK.

Figure 3-3

## 1988 ADF&G Minor Harvest Areas



SOURCE: ADF&G Subsistence Division.

### 3 Affected Environment

Table 3-13

#### Hunting Subunit Boundary Changes and Corresponding VCUs

OLD	NEW	VCU
3523B	3523	202 <sup>1</sup>
		203
		204
3524	3524	205
		206
		207
3625	3525	213
		214
		215
3626	3626	216
		217
		218
3531		208
		209
		210
3626		211
		212
		219
		220
		221

<sup>1</sup> Approximately half of this VCU is in new Minor Harvest Area 3523.

comparable to the data from previous years as shown in Tables 3-10, 3-11, and 3-12. In 1988, 987 hunters, utilizing 4,592 hunter days, harvested 1,514 Sitka black-tailed deer in Analysis Area 3. Additional information concerning subsistence hunting by community can be found in the Subsistence section of this EIS.

Deer are an important subsistence and sport hunting resource used by rural and non-rural communities in the vicinity of Analysis Area 3. The 1987 Tongass Resource Use Cooperative Study found that deer made up 5 to 39 percent of the per-capita harvest of principal subsistence resources used by the rural communities in the vicinity of AA3. To understand the importance of this subsistence resource, ADF&G conducted a survey of the 1987 deer harvest (ADF&G 1987 Hunter Survey). The survey included information on the number of deer hunters and actual deer harvest per hunter. Then each hunter was asked how many deer they needed to harvest for a season to be considered successful and how many deer they desired to harvest (Table 3-14). A successful season was based on responses to the question: What is your idea of a successful deer season? The desired deer per hunter was based on responses to the question: What is the number of deer you would like to harvest each year? This information provides the basis for comparing subsistence use and sport hunting of deer with the habitat capability changes due to timber harvest. The subsistence section of this document discusses this issue in more detail.

A habitat capability model (Consolidated Appendix, Volume III, E-1) was used to estimate the number of Sitka black-tailed deer that could be sustained in Analysis Area 3 based on the projected deer habitat capability (Table 3-15). Several factors were considered including the acreage of forested lands, elevation, and snow depth. Forested land acres were derived from the

TLMP database and included clearcuts from 0 to 25 years in age, second-growth timber, non-commercial forest, and commercial forest of low volume (8 to 20 MBF/acre), mid volume (20 to 30 MBF/acre), and high volume (30+ MBF/acre). Habitat use estimates were calculated for elevations both below and above 800 feet. Snow depths were based on the number of days with greater than 12 inches on the ground and mean annual snowfall. These categories included low (0 to 20 inches), medium (20 to 80 inches), and high (80 to 160 inches).

The estimated deer numbers in Table 3-15 include information on carrying capacity at the start of the APC Contract (1961) and the present condition to 1988. The habitat capability numbers also reflect timber harvest activities on Tenakee Springs and Native Corporation lands through September 1, 1988. The table shows that Analysis Area 3 on Chichagof Island could potentially carry approximately 5,700 deer in 1961. Estimates to 1988 indicate that same area could carry approximately 5,300 deer, which represents a 7.1 percent reduction since 1961.

Table 3-16 provides a comparison of the potential deer habitat capability, the 1988 deer harvest, and the deer population needed to support that level of harvest. To adequately compare this information, the assumption is made that habitat capability estimates reflect an approximate deer population level. The table has been constructed using new ADF&G boundaries as discussed earlier in the Wildlife section.

Black-tailed deer projected habitat capability is shown for the baseline year of 1961 before APC contract cutting began and the existing level following the 1988 harvest season. This information provides an indication of how timber harvest activities have affected the habitat capability for black-tailed deer populations. 1988 deer harvest levels were provided by ADF&G annual hunting and trapping records. Although the 1988 harvest levels have not been published, ADF&G did provide these numbers through personal communication.

Table 3-14

#### Hunter Desires for Deer by Subsistence Community<sup>1</sup>

Community	Number Of Hunters	Actual <sup>2</sup>	Deer Per Hunter For Successful Season <sup>3</sup>	Desired <sup>4</sup>
Angoon	95	5.2	4.2	6.0
Chatham	1	6.0	0.0	10.0
Eight Fathom Bight	6	4.0	4.0	4.0
Elfin Cove	13	2.5	2.7	4.8
Excursion Inlet	3	3.0	6.0	6.0
Freshwater Bay	12	3.6	1.0	6.5
Gustavus	42	2.3	3.1	4.7
Haines	177	2.6	3.7	5.4
Hoonah	299	2.5	3.4	5.2
Petersburg	665	2.2	2.7	3.9
Sitka	2,011	2.8	3.5	5.1
Tenakee Springs	37	3.3	3.6	4.7
Whitestone Logging	79	2.3	2.6	4.0

SOURCE: ADF&G 1987 Hunter Survey.

<sup>1</sup> Subsistence Communities include those communities whose residents use the APC Sale Area for subsistence.

<sup>2</sup> Actual number of deer harvested per hunter in 1987.

<sup>3</sup> Number of deer per hunter needed for successful season was based on responses to the question: "What is your idea of a successful deer season?"

<sup>4</sup> Number of deer per hunter desired was based on responses to the question: "What is the number of deer you would like to harvest each year?"

### 3 Affected Environment

Table 3-15

#### Projected Sitka Black-tailed Deer Numbers Based on a Habitat Capability Model

VCU	Pre-APC 1961	1988	Percent Change
<i>Minor Harvest Area 3523</i>			
203	167	167	0
204	551	530	3.8
204 <sup>1</sup>	102	99	2.9
205	177	170	4.0
205 <sup>1</sup>	144	133	7.6
206 <sup>1</sup>	203	166	18.2
216	78	66	15.4
Subtotal	1,422	1,331	6.4 <sup>2</sup>
<i>Minor Harvest Area 3524</i>			
207	261	261	0
207 <sup>1</sup>	491	386	21.4
208	101	101	0
208 <sup>1</sup>	6	6	0
209	260	233	10.4
Subtotal	1,119	987	11.8 <sup>2</sup>
<i>Minor Harvest Area 3625</i>			
210	279	279	0
211	143	143	0
212	287	287	0
213	120	120	0
214	124	124	0
215	584	549	6.0
217	370	324	12.4
218	438	384	12.3
Subtotal	2,345	2,210	5.8 <sup>2</sup>

(Continued)

The population number needed to support 1988 harvest levels shown on Table 3-16 has been derived through ADF&G research and computer modeling. This information is discussed in a non-published ADF&G document produced in September 1989 entitled "Harvest Rates of Sitka Black-tailed Deer Populations in Southeast Alaska For Land-use Planning." The paper provides a rationale for a sustainable harvest rate to use in deer habitat and population management planning. The ADF&G results of simulation modeling and background research indicate that a deer harvest rate of 10 percent should be used in land-use and population management planning in Southeast Alaska. This harvest rate was determined appropriate to use in conjunction with

Table 3-15 (Continued)

**Projected Sitka Black-tailed Deer Numbers Based on a Habitat Capability Model**

VCU	Pre-APC 1961	1988	Percent Change
<i>Minor Harvest Area 3626</i>			
219	161	154	4.3
219 <sup>3</sup>	25	25	0
220	437	409	6.4
220 <sup>3</sup>	107	107	0
221	109	95	12.8
221 <sup>3</sup>	11	11	0
Subtotal	850	801	5.8 <sup>2</sup>
Total	5,736	5,329	7.1 <sup>4</sup>

SOURCE: Forest Service in consultation with ADF&G (SEIS Planning Record). See Consolidated Appendix, Volume II, C-3, on Data Adequacy and Models.

<sup>1</sup> Native Corporation land.

<sup>2</sup> This value represents the percent reduction in the entire Minor Harvest Area.

<sup>3</sup> Private land.

<sup>4</sup> This value represents the percent reduction in the entire Analysis Area.

habitat capability estimates available from models developed for use in the area. As indicated in Table 3-16, the population numbers needed to sustain current harvest levels are 10 times the 1988 deer harvest record.

Applying ADF&G guidelines to the current harvest level indicates that the deer population needed to support that harvest exceeds the 1989 projected habitat capability in Minor Harvest Areas 3523, 3524, and 3531. In Minor Harvest Area 3524, the population requirement is almost four times the 1989 habitat capability projection. Further analysis of the information also reveals that deer harvest exceeded necessary population numbers in all three Minor Harvest Areas before APC timber harvest began in 1961.

#### Brown Bear

In North America today, the largest population of brown bears occurs in Alaska (Peek, et al. 1987) where there are an estimated 30,000 to 40,000 bears (Alaska Department of Fish and Game 1978). Brown bear is the common name for *Ursus arctos*, which are known as grizzly bear in the Interior. Brown bears are indigenous to Southeast Alaska, where they occur throughout the mainland coast and on the islands north of Frederick Sound. The northern islands of Admiralty, Baranof, and Chichagof have some of the highest brown bear densities in the world (Dufresne and Williams 1932, Schoen and Beier 1986).



Brown Bear

Although much of Southeast Alaska is still undeveloped, logging and mining occur throughout the range of the brown bear. Game Management Unit 4, which includes Admiralty, Baranof, and Chichagof islands, is one of the most important brown bear hunting regions in the state. This area ranks third behind the Alaska Peninsula and Kodiak Archipelago with an average annual harvest of 67 bears (Johnson 1980, ADF&G Annual Hunting and Trapping Reports). Tourism and outdoor recreation are growing industries in this area. Brown bears are one of the

### 3 Affected Environment

Table 3-16

#### Comparison of Projected Sitka Black-tailed Deer Habitat Capability, 1988 Harvest, and Numbers Identified to Support Harvest

Minor Harvest Area	Projected Habitat Capability		1988 Deer Harvested	Population Numbers Needed to Support Harvest
	Pre-APC 1961	1989		
3523 <sup>1</sup>	1,069	1,025	184	1,840
3524 <sup>2</sup>	1,276	1,116	444	4,440
3531 <sup>3</sup>	1,076	1,049	145	1,450
3525 <sup>4</sup>	1,714	1,567	364	3,640
3626 <sup>5</sup>	850	801	176	1,760

<sup>1</sup> Includes VCUs 202, 203, and 204. The following communities were identified in the 1988 harvest record as using this area: Hoonah, Juneau, Haines, Gustavus, Whitstone, and Petersburg.

<sup>2</sup> Includes VCUs 205, 206, and 207. The following communities were identified in the 1988 harvest record as using this area: Hoonah, Juneau, Haines, Whitstone, Ketchikan, and Sitka.

<sup>3</sup> Includes VCUs 208, 209, 210, 211, and 212. The following communities were identified in the 1988 harvest record as using this area: Hoonah, Juneau, Haines, Whitstone, Petersburg, and Port Alexander.

<sup>4</sup> Includes VCUs 213, 214, 215, 216, 217, and 218. The following communities were identified in the 1988 harvest record as using this area: Hoonah, Juneau, Haines, Whitstone, Tenakee Springs, Sitka, and Wrangell.

<sup>5</sup> Includes VCUs 219, 220, and 221. The following communities were identified in the 1988 harvest record as using this area: Juneau and Tenakee Springs.

unique features of the Tongass Forest and many visitors to Southeast Alaska are interested in an opportunity to observe this impressive animal.

The ADF&G began brown bear investigations in Southeast Alaska during 1981 with particular emphasis on habitat relationships and the influence of logging and mining activities on bear populations. Since 1981, 70 brown bears have been radio-collared on Admiralty Island and information collected from over 2,700 radio telemetry sightings (Schoen and Beier 1986). The information obtained from this research indicates that the annual use of habitat types by the brown bear includes: upland and beach fringe old-growth forest (33 percent), riparian old-growth forest (23 percent), alpine/subalpine (21 percent), avalanche slopes (14 percent), wetlands (5 percent), and other (4 percent). Habitat use by these brown bears varied seasonally and corresponded to differences in the seasonal abundance and quality of forage items dispersed throughout a patchy environment.

The following pattern of seasonal habitat use was derived from monitoring radio-collared bears on Admiralty Island (Schoen, In Press). Brown bears begin emerging from high-elevation dens during April and emergence continues through May. After they leave the den, many bears move to low-elevation, old-growth forests, coastal sedge meadows, or other open areas where tender new herbaceous vegetation can be found. During early summer (mid-June through mid-July), most bears move up to forested slopes and alpine/subalpine meadows where they forage on newly-emergent vegetation and berries.

The brown bear concentrates on low-elevation coastal salmon streams from mid-July through early September. During this period, 60 percent of all bear relocations (radio telemetry sightings) occurred within 0.1 mile of these streams while 39 percent were in riparian old-growth habitat (Schoen and Beier, unpublished). Though most bears are associated with fish streams at this time, some bears (primarily females) remain in interior regions of the island throughout the year (Schoen, et al. 1986). By mid-September, many bears begin moving toward upper-elevation forests, avalanche slopes, and subalpine meadows.

Winter denning begins in October and November. Mean elevation and slope of 121 den sites of radio-collared bears from Admiralty and Chichagof islands were 2,100 feet and 35 degrees (Schoen, et al. 1987). Fifty-two percent of those dens occurred in old-growth forest habitat. Though cave denning was common on Admiralty Island, many dens were excavated under large-diameter old-growth trees or into the bases of large snags (Schoen, et al. 1987).

Brown bears, in general, are opportunistic omnivores and able to utilize a variety of food sources. The seasonal food habits of Admiralty Island brown bears was described by McCarthy (1988). During spring, the diet is dominated by sedges, other green vegetation, roots, and deer. Sedges and salmon are the major food items consumed during summer, although skunk cabbage, devil's club berries, and other plants, berries, and roots are also used. During fall, salmon, devil's club berries, skunk cabbage, sedge, beach lovage roots, and currants dominate the diet. The distribution of bears correspond closely to the seasonal abundance and quality of the food items listed.

In Southeast Alaska, overmature forest is used extensively throughout the year by brown bears for foraging, cover, and denning. Clearcut logging generally results in the production of an abundance of bear forage plants during early stages of forest succession (Mealy, et al. 1977, Lindzey and Meslow 1977, Zager, et al. 1983). Theoretically, these sites should provide good or adequate habitat for a generalist species like the brown bear. However, on Chichagof Island, only 2 percent of the 866 relocations of 27 radio-collared bears occurred in clearcuts with young second growth timber (Schoen and Beier 1986). To help understand this use pattern, it should be noted that the study area was comprised of only 6 percent of this habitat type. Further, it is suspected that brown bears made limited use of young second growth because other sites (e.g., alpine/subalpine habitat, wetlands, riparian old growth, avalanche slopes) provided better foraging.

Table 3-17 shows brown bear harvest within ADF&G Minor Harvest Areas 3523B, 3524, 3625, and 3626. The table reflects an increasing harvest over the last five years with the greatest harvest of 24 bears in 1987. The harvest data reflect a general increase in road access, timber harvest, and permanent communities within Analysis Area 3. The increased road density and resulting access to brown bear habitat has a direct effect on the bear population numbers. Since 1980, roads have been built from Hoonah to the Freshwater Bay area and Whitestone Harbor. In addition, all the timber harvest on Native Corporation lands has occurred within that time frame. This local pressure and the ability of adjacent communities to access the area by roads or the marine highway system ferry has put even more hunting pressure and "defense of life or property kills" on the brown bear.

A habitat capability model was used to estimate the number of brown bears that could be sustained in Analysis Area 3 based on the projected habitat capability (Table 3-18). Several factors were considered including the acreage of forested and non-forested lands. Forested land acres were derived from the TLMP database and included clearcuts from 0 to 25 years in age, second-growth timber, noncommercial forest, and commercial forest of low volume (8 to 20 MBF/acre), mid volume (20 to 30 MBF/acre), and high volume (30+ MBF/acre). Other factors used to calculate habitat capability included the presence of permanent communities, the method of garbage disposal in those communities (open dumps or incineration) and road density per square mile in each VCU.

The estimated brown bear numbers in Table 3-18 include information on carrying capacity at the start of the APC Contract (1961) and the present condition to 1988. The habitat capability numbers also reflect timber harvest activities on Tenakee Springs and Native Corporation lands through September 1, 1988. The table shows that Analysis Area 3 on Chichagof Island could potentially carry approximately 260 brown bears in 1961. Estimates to 1988 indicate that same area could carry approximately 140 brown bears, which represents a 46.9 percent reduction since 1961.

### 3 Affected Environment

During the fall of 1988, ADF&G (Game Board) instituted an emergency closure of the hunting season on northeast Chichagof Island. The hunting closure affected the island north of Tenakee Inlet and east of Port Frederick. The area includes Analysis Area 3 and a portion of Analysis Area 3 from the southeastern section of VCU 202, to all of VCUs 222 and 223. This closure was a result of the Game Board's concern that too many bears were being killed by hunters and "in defense of life or property" (DLP).

Road construction since the early 1980s has increased access to much of northeast Chichagof Island. The expanding access is thought to have contributed to increased hunter success and has also resulted in more frequent human - bear encounters. Sometimes these encounters end with bears killed "in defense of life or property." Because bears are attracted to human refuse dumps, several DLP killings have been reported in these locations. To deal with the problem over the long term, ADF&F adopted new regulations during the winter of 1988-89. The new regulations established a "controlled use area" which included the previous areas under emergency closure and the following regulations:

- 5 AAC 78.400. Controlled Use Areas.

The use of motorized vehicles for hunting is restricted within the Controlled Use Area.

- 5 AAC 78.300(6). No hunting activities are allowed within 1/4 mile of refuse dump sites that are permitted by the Alaska Department of Environmental Conservation. This regulation affects the hunting of brown bear within 1/4 mile of refuse sites such as those at the towns of Hoonah and Tenakee Springs, and the Kennel Creek logging camp.
- 5 AAC 78.020 and 5 AAC 78.120. Subsistence and General Hunting Seasons and Bag Limits for Brown and Grizzly Bear.

The fall hunting season was eliminated and the spring season open only from March 1st to May 20th. In addition, the bag limit is restricted to one bear every four regulatory years and the hunter is required to obtain a registration permit from ADF&G.

- ADF&G 1989 Harvest Thresholds

Table 3-17

#### Number of Brown Bears Harvested

Year	3523B	3524	3625	3626	Total
1980	1	2	3	1	7
1981	4	2	3	1	10
1982	4	0	0	0	4
1983	4	2	0	0	6
1984	4	1	3	1	9
1985	7	4	0	2	13
1986	2	5	4	0	11
1987	8	5	8	3	24

SOURCE: ADF&G Annual Hunting and Trapping Reports, Juneau, AK.

Table 3-18

**Projected Brown Bear Numbers Based on a Habitat Capability Model**

VCU	Pre-APC 1961	1988	Percent Change
<i>Minor Harvest Area 3523</i>			
203	12	11	8.3
204	29	16	44.8
204 <sup>1</sup>	7	3	57.1
205	2	1	50.0
205 <sup>1</sup>	9	2	77.8
206 <sup>1</sup>	7	0	100.0
216	12	6	50.0
Subtotal	78	39	50.0 <sup>2</sup>
<i>Minor Harvest Area 3524</i>			
207	13	13	0
207 <sup>1</sup>	17	4	76.5
208	7	4	42.9
209	15	6	60.0
Subtotal	52	27	48.1 <sup>2</sup>
<i>Minor Harvest Area 3625</i>			
210	15	7	53.3
211	6	6	0
212	15	15	0
213	5	2	60.0
214	7	3	57.1
215	29	12	58.6
217	15	5	66.7
218	12	6	50.0
Subtotal	104	56	46.2 <sup>2</sup>

(Continued)

### 3 Affected Environment

Table 3-18 (Continued)

#### Projected Brown Bear Numbers Based on a Habitat Capability Model

VCU	Pre-APC 1961	1988	Percent Change
<i>Minor Harvest Area 3626</i>			
219	5	4	20.0
220	16	8	50.0
221	5	4	20.0
Subtotal	26	16	38.5 <sup>2</sup>
Total	260	138	46.9 <sup>3</sup>

SOURCE: Forest Service in consultation with ADF&G (SEIS Planning Record). See Consolidated Appendix, Volume II, C-3, on Data Adequacy and Models.

<sup>1</sup> Native Corporation land.

<sup>2</sup> This value represents the percent reduction in the entire Minor Harvest Area.

<sup>3</sup> This value represents the percent reduction in the entire Analysis Area.

ADF&G has devised a series of brown bear harvest thresholds on northeast Chichagof Island. The proposed threshold system will allow the harvest to accumulate to what is considered a safe level thereby maintaining a harvestable brown bear population (Johnson 1989). Brown bear kills from both the spring hunt and DLP are being tracked. The threshold system utilizes a set of points where sows equal 3 points and boars equal 1 point. ADF&G has advised hunters that if the number of points from brown bear kills exceeds a predetermined upper limit by May 1 or May 10, the remaining 1989 season will be closed. If the number of points from harvest and DLP kills exceeds the threshold limit set for November 1, the 1990 season and possibly beyond will be closed.

The purpose behind the new regulations is to allow the Game Board a management option over that portion of the brown bear kill attributable to sport harvest. DLP kills and other bear losses are still expected from increased bear - human encounters. The Game Board has indicated a solution to the whole problem will ultimately be to regulate hunting use of the new roads, eliminate improper garbage disposal, and reduce DLP kills through public education. The restriction of motorized vehicle use will benefit those who hunt from a boat or walk into the hunting area and discourage those hunters who use vehicles to gain easy access. The overall benefits will include a bear population better able to sustain itself.



Pine Marten

#### Pine Marten

Pine martens are animals that use overmature forests, including beach fringe and streamside areas. The species prefers mature conifer or mixed forest stands, although there are indications that it may be adaptable to a variety of forest habitats (Soutiere 1979). Use of habitat by the marten is related to occurrence and availability of foods and to cover characteristics. Extensive overmature forests have been called the mainstay of marten populations in the Pacific states because they provide many den sites and abundant prey items (Meslow, et al. 1981).

Pine martens are native to Southeast Alaska but apparently did not occur naturally on the islands north of Frederick Sound or Prince of Wales Island. To provide jobs for unemployed Alaskans, the Bureau of Biological Survey and the Civil Works Commission began a program

in 1934 to transplant various species including the pine marten (Johnson 1981). Initial releases were made on Prince of Wales and Baranof Islands.

Efforts to establish pine marten on Chichagof Island began in 1949 by transplanting two males and six females from Baranof Island. Fifteen more animals were transplanted to the Pelican area during 1951 and 1952. To protect the new introductions, no trapping season was allowed for the marten on Chichagof Island from 1948 through 1962. In addition to that specific closure, marten seasons were generally offered only on an alternate year basis from 1925 through 1962 (Johnson 1981).

Martens are active throughout the year. Their constant activities above the ground are believed to require considerable energy to raise or lower body temperature (Worthen and Kilgore 1981). As a result, they require proportionately large volumes of food during temperature extremes. They eat small mammals, birds, insects, and fruit. The red-backed vole is the staple food source throughout the year but is most important during the winter. The limited distribution of red-backed voles in Southeast Alaska may result in dependence of the marten on red squirrels. The use of birds and their eggs increases in the diet during June and July when they are most vulnerable to martens. Fruits, berries, and some insects make up a large part of the marten diet during late summer.

Snags provide martens with important den sites and sites for resting activities in both winter and summer (Spencer 1987). They utilize the tops of broken snags as resting sites in the summer and the cavities as den sites in winter and summer. Preferred snags have been reported to range from 16 to 58 inches diameter at breast height (DBH) (Campbell 1979, Simon 1980, Spencer 1987).

Johnson (1981) summarized population densities from several sources and reported a range of 0.6 to 1.9 martens per square kilometer (1.6 to 4.9 per square mile). Martens are trapped for their furs, and would be vulnerable to habitat loss and increased access.

Table 3-19 shows pine marten harvest within ADF&G Minor Harvest Areas 3523B, 3524, 3625, and 3626. The table shows a trend toward harvesting fewer pine marten, especially over the last several years. Typically, pine martens are harvested in the winter by trapping. The trapper will generally get to a shoreline area by boat and then hike to his traplines. In Analysis Area 3, however the amount of roads constructed within the last few years has increased trapping access. Even though road density has increased, the harvest data suggest no substantial increase in pine marten harvest has been recorded.

A computer model was used to estimate the number of pine marten that could be sustained in Analysis Area 3, based on the projected habitat capability (Table 3-20). Several factors were considered including the type of forested lands, roads, and elevation. Forest land information was calculated from the timber layer of a Geographic Information System database being developed in the revisions of the Tongass Land Management Plan. These lands included clearcuts from 0 to 25 years in age, second-growth timber, noncommercial forest, and commercial

Table 3-19

### Number of Pine Martens Harvested

Year	Minor Harvest Area					Total
	3500	3523B	3524	3625	3626	
1984/1985	42	195	50	0	20	307
1985/1986	0	76	0	0	14	90
1986/1987	8	56	11	61	14	150
1987/1988	0	11	38	0	39	88

SOURCE: ADF&G Annual Hunting and Trapping Reports, Juneau, AK.

### 3 Affected Environment

Table 3-20

#### Projected Pine Marten Numbers Based on a Habitat Capability Model

VCU	Pre-APC 1961	1988	Percent Change
<i>Minor Harvest Area 3523</i>			
203	24	21	12.5
204	71	57	19.7
204 <sup>1</sup>	13	1	92.3
205	8	6	25.0
205 <sup>1</sup>	15	1	93.3
206 <sup>1</sup>	18	2	88.9
216	22	8	63.6
Subtotal	171	96	43.9 <sup>2</sup>
<i>Minor Harvest Area 3524</i>			
207	31	27	12.9
207 <sup>1</sup>	43	4	90.7
208	15	9	40.0
208 <sup>1</sup>	1	1	0
209	36	3	91.7
Subtotal	126	44	65.1 <sup>2</sup>
<i>Minor Harvest Area 3625</i>			
210	39	3	92.3
211	16	14	12.5
212	39	33	15.4
213	15	13	13.3
214	16	13	18.8
215	66	23	65.2
217	35	3	91.4
218	52	4	92.3
Subtotal	278	106	61.9 <sup>2</sup>

(Continued)

Table 3-20 (Continued)

**Projected Pine Marten Numbers Based on a Habitat Capability Model**

VCU	Pre-APC 1961	1988	Percent Change
<i>Minor Harvest Area 3626</i>			
219	20	17	15.0
219 <sup>3</sup>	2	2	0
220	46	12	73.9
220 <sup>3</sup>	10	10	0
221	14	10	28.6
221 <sup>3</sup>	0	0	0
Subtotal	92	51	44.6 <sup>2</sup>
Total	667	297	55.5 <sup>4</sup>

SOURCE: Forest Service in consultation with ADI&G (SEIS Planning Record). See Consolidated Appendix, Volume C-3, on Data Adequacy and Models.

<sup>1</sup> Native Corporation land.

<sup>2</sup> This value represents the percent reduction in the entire Minor Harvest Area.

<sup>3</sup> Private land.

<sup>4</sup> This value represents the percent reduction in the entire Analysis Area.

forest of low volume (8 to 20 MBF/acre), mid volume (20 to 30 MBF/acre), and high volume (30+ MBF/acre). Habitat use estimates were calculated for evaluations both below and above 800 feet.

The estimated pine marten numbers in Table 3-20 include information on carrying capacity at the start of the APC Contract (1961) and the present condition to 1988. The habitat capability numbers also reflect timber harvest activities on Tenakee Springs and Native Corporation lands through September 1, 1988. The table shows that Analysis Area 3 on Chichagof Island could potentially carry approximately 600 pine martens in 1961. When the effects of road density are considered, estimates to 1988 indicate that same area could carry approximately 560 pine martens, which represents a 6.7 percent reduction since 1961. Open roads are roads that are open to public access.

#### Land Otter

Land otters generally occur close to the beach (Larsen 1983, Woolington 1984) in the areas recognized as beach fringe habitat. Some also occur along streams and lakes. Otters appear to be relatively intolerant of man, but they are opportunistic and will use man-made structures and log jams, as well as natural cavities and beaver lodges, for dens and resting sites. Otters den and rest in root systems of trees, under logs and rocks, and in other protected sites. Radiotelemetry data show extensive movements along the coastline, and otter sightings in freshwater habitats are common.

Habitat selection is largely a product of food availability. Food items include fish, abalone, sea urchins, chitons, crabs, and other marine invertebrates; however, fish are generally the main food source. Land otters are furbearers pursued by trappers, and the populations would be af-



Land Otter

### 3 Affected Environment

Table 3-21

#### Number of Land Otters Harvested

Year	3523B	3524	3625	3626	Total
1979/1980	11	0	13	0	24
1980/1981	0	0	6	1	7
1981/1982	3	0	11	0	14
1982/1983	0	0	4	0	4
1983/1984	3	0	3	0	6
1984/1985	6	0	7	0	13
1985/1986	3	0	0	3	6
1986/1987	0	1	0	0	1
1987/1988	0	0	0	0	0

SOURCE: ADF&G Annual Hunting and Trapping Reports, Juneau, AK.

fected by increased access to trappers (assuming no change in current State regulations or limits and no downward trend in pelt values). Typically, land otters are harvested in the winter by trapping. Access to the trapping areas is difficult because of winter conditions and the lack of roads. The trapper will generally travel to a shoreline area by boat and then hike to his traplines. Table 3-21 shows land otter harvest within ADF&G Minor Harvest Areas 3523B, 3524, 3625, and 3626. The table shows a trend toward harvesting fewer land otters, especially over the last several years.

#### Bald Eagle

The population of bald eagles is widely dispersed throughout Southeast Alaska during the breeding season. Bald eagles that breed along the coast tend to remain close to their breeding territory throughout the year if food is available. When not involved in nesting activities, however, these birds may temporarily move to feed at abundant sources of food. Habitats commonly used include beach fringe, some estuarine fringe, and streamside riparian. Bald eagles may also concentrate at feeding grounds in the spring. Throughout their range, bald eagles are opportunistic in their use of available food resources. Fish is the dietary mainstay in Southeast Alaska (Kalmbach et al. 1964). This study identified fish as 65.7 percent of the year-round diet, although a variety of other foods were taken. These included birds (18.8 percent), mammals (1.2 percent), invertebrates (2.0 percent), and carrion (12.3 percent).



Bald Eagle

Foraging methods of bald eagles include scavenging, hunting live prey, and stealing food from other eagles and other species of fish-eating birds (Evans 1982). Reports along the Chilkat River indicate that bald eagles fed on spawned out salmon carcasses during fall and winter. In summer, they fed on live fish as well as carcasses.

Breeding activities in Southeast Alaska begin as early as February, and involve establishment and defense of the breeding area. Typical nesting habitat along the coastline occurs in the old-growth forests with Sitka spruce trees comprising the majority of nest sites. The selected tree generally has a top that is bushy, broken, or deformed. Such tops are more likely to provide strong support for the massive nest that is built. The nest platform is typically constructed of sticks up to 4 feet long and 2 inches in diameter. Mosses are used to line the nest, along with lesser amounts of grasses, twigs, seaweed, and other debris. The eagles tend to use the same nest year after year, making repairs as needed. They often construct alternate nests, and occasionally switch their use to them.

Table 3-22  
**Number of Eagle Nests<sup>1</sup>**

VCU	Inventoried Nest Trees
203	5
204	8
205 <sup>2</sup>	0
206	6
207	3
208	14
209	6
210	12
211	12
212	5
213	6
214	3
215	8
216	0
217	14
218	10
219	15
220	3
221	1
Total	131

SOURCE: 1986-90 FEIS (Forest Service 1986b) and U.S. Fish and Wildlife Service, Bald Eagle Survey, Juneau, AK.

<sup>1</sup> Inventoried nest trees on all lands within Analysis Area 3.

<sup>2</sup> This VCU has not been inventoried.

Perching sites are an important component of bald eagle nesting habitat. They perch on tall trees and snags to scan the water and shore for food. They also use these vantage points to protect their nests from avian predators. Tall trees having a clear view of the nest and surrounding water provide the most valuable perching sites. Other functions suggested for perch trees include: sites for consuming prey, sites for display to attract potential mates, and conspicuous posts from which territory occupation may be signaled (Stalmaster, et al. 1985).

Bald eagle populations in Southeast Alaska have increased since the establishment of the Memorandum of Understanding between the Forest Service and the US Fish and Wildlife Service in 1968, and as amended in 1984, and the cessation of the State bounty in 1952. This population increase resulted primarily from the protection of the eagles themselves and their nests by providing a 330-foot buffer strip around identified nesting sites. Population estimates based on transects flown by the Fish and Wildlife Service show an increase in number from about 7,000 birds in the early 1970s to over 12,000 in 1987 (Forest Service 1988b). During the same period, the number of bald eagle nests has also exhibited a marked increase. Bald eagles that nest within the Alaska region comprise over half of the bald eagle population of the entire 50 states and about one-third of the continental population. Table 3-22 shows the number of inventoried eagle nest trees by VCU for Analysis Area 3.

### 3 Affected Environment



Vancouver Canada Goose

#### Vancouver Canada Goose

Vancouver Canada geese are unique among all subspecies of Canada geese in that they use forested habitat for nesting and brood rearing (Lebeda and Ratti 1983). Lebeda (1980) reported that Vancouver Canada geese made use of both noncommercial forest land and low-volume commercial forest land. They nest in wetlands that are found within these forest types (the presence of wetlands correlates with sparse forest cover in such areas). Feeding in wetland edges that may extend into surrounding forest occurs until the young can fly. Then ranging farther away to feed, they eventually reach lush estuarine areas from where they may begin their fall migration south.

#### Threatened or Endangered Species

Consultation with the US Fish and Wildlife Service and National Marine Fisheries Service during preparation of the 1986-90 FEIS identified no inventoried resident threatened or endangered species in Analysis Area 3. Habitats for two migrating endangered species exist in the area or in the waters nearby. The American peregrine falcon (*Falco peregrinus anatum*) passes through the forests during spring and fall migration flights. The humpback whale (*Megaptera novaeangliae*) inhabits nearby waters, but there is no designated critical habitat near areas of existing or planned log transfer facilities. Letters documenting the consultation process are found in Consolidated Appendix, Volume III, H.

## Fisheries

The fishing industry provides a major source of income for Southeast Alaska. Fishing, especially for salmon, is also a major source of subsistence for residents in the APC Contract area. Abundant streams and lakes in the area provide spawning and rearing habitat for pink (humpy), chum (dog), coho (silver), and sockeye (red) salmon. Steelhead trout, dolly varden char, and cutthroat trout occur in Southeast Alaska and contribute to a viable sport fishery. The maintenance of a strong and productive fishery, therefore, is very important to the area's economy. Sustaining the production of salmon for commercial, sport, and subsistence harvest is depend-



A Steep Pass Fish Ladder in Pavlof Creek Provides Returning Adult Sockeye Salmon Access to Pavlof Lake.

ent upon area specific harvest management plans and habitat protection. Timber harvest activities can have a significant effect on freshwater habitat that may result in impacts on salmon production. This section identifies the salmon production potential and aquatic habitat conditions in Analysis Area 3.

The average annual salmon production potential of streams in Analysis Area 3 exceeds 683,000 pounds (see Table 3-23). Pink salmon contributes the largest portion (63 percent) of the production potential followed in order of abundance by chum (32 percent) and coho (5 percent) salmon. Most of the pink salmon and chum salmon production is derived from Game Creek (VCU 204), Freshwater and Bayhead Creeks (VCU 215), Indian River (VCU 220), and Iyouktug Creek (VCU 210). The Pavlof River and Pavlof Lake (VCU 218) have small but significant runs of sockeye salmon. Many of these streams also provide habitat for anadromous trout and char, but the level of production is unknown.

A description of stream conditions in this analysis area is facilitated by use of a three-level stream classification system described in the Aquatic Habitat Management Handbook (Forest Service 1986a). Each stream is subdivided into Aquatic Habitat Management Units (AHMU), which are based on fish use and stream channel characteristics. The area defined by an AHMU includes the stream channel, areas within braided stream channels, and adjacent riparian areas

Table 3-23

**Average Annual Weight of Salmon Available for Commercial Harvest in Thousands of Pounds<sup>1</sup>**

VCU	Pink	Chum	Coho	Total
203	16.8	— <sup>2</sup>	1.1	17.9
204	70.3	113.2	7.1	190.6
205	— <sup>3</sup>	— <sup>3</sup>	— <sup>3</sup>	— <sup>3</sup>
207	— <sup>3</sup>	— <sup>3</sup>	— <sup>3</sup>	— <sup>3</sup>
208	9.7	— <sup>2</sup>	2.2	11.9
209	34.0	— <sup>2</sup>	3.9	37.9
210	32.9	— <sup>2</sup>	5.2	38.1
211	0.0	0.0	0.0	0.0
212	16.6	— <sup>2</sup>	2.9	19.5
213	0.3	— <sup>2</sup>	0.1	0.4
214	5.1	0.3	0.4	5.8
215	57.7	51.0	5.1	113.8
216	0.0	0.0	0.0	0.0
217	8.3	12.7	2.1	23.1
218	31.4	— <sup>2</sup>	5.9	37.3
219	6.3	1.0	0.3	7.6
220	140.0 <sup>4</sup>	40.0 <sup>4</sup>	— <sup>2</sup>	180.0 <sup>4</sup>
221	— <sup>0.0</sup>	— <sup>0.0</sup>	— <sup>0.0</sup>	— <sup>0.0</sup>
Total	429.4	218.2	36.3	683.9
Percent	63	32	5	100

<sup>1</sup> Based on data from Holstine and Collizi (1984).

<sup>2</sup> Not surveyed.

<sup>3</sup> No data available.

<sup>4</sup> ADF&G memorandum from Don Ingledue to Don Cornelius dated October 7, 1988 (SEIS Planning Record).

## 3 Affected Environment

containing side channels and sloughs. In the absence of any site-specific information it includes an area at least 100 feet wide on either side of the stream.

Class I streams, as defined in the 1986-90 FEIS, are stream channels that are accessible to anadromous fish (i.e., pink, chum, sockeye, and coho salmon) or channels upstream of migration barriers, which have reasonable enhancement opportunities for anadromous fish, and high quality resident fish habitat. Class II streams, as defined in the 1986-90 FEIS, are stream channels that have a steep gradient (6 to 15 percent) and generally only contain resident fish populations (i.e., cutthroat trout and dolly varden char) or channels that are upstream of a migration barrier. Class II channels may contain potential anadromous fish habitat. Class III streams do not have fish populations but have potential water quality influence on downstream aquatic habitats in Class I and Class II channels. Since these streams do not contain fish, they are not included in the analysis of potential impacts of the proposed alternatives in Chapter 4.

Analysis Area 3 has 290 miles of usable stream habitat for salmon, trout, and char. Class I streams account for 47 percent (137 miles) of the available habitat. Class II streams, which do not have anadromous fish, account for 53 percent (153 miles) of the habitat. This only accounts for stream habitat on National Forest land.

Only a small proportion of the available National Forest land fish habitat in Class I and Class II streams has potentially been affected by timber harvest activities in Analysis Area 3. Seven percent (19.7 miles) of the stream habitat had logging to the stream bank (i.e., on one or both sides and without a buffer zone) as of 1986 (Table 3-24). Most of this logging occurred along Kennel Creek (6.0 miles) in VCU 217, Freshwater Creek (4.8 miles) in VCU 215, and Game Creek (3.0 miles) in VCU 204. In general, most of the existing logging roads occur in the same basins as the logged areas.

## Watersheds

The water quality of southeast Alaska is good in terms of sediment levels, temperatures, and water chemistry. A combination of steep slopes, heavy precipitation, and the limited water-holding capacity of watersheds results in fairly predictable seasonal flow characteristics. The alternative maps which accompany this FEIS show the Class I and Class II streams. Stream



Pavlof Lake Watershed

Table 3-24

**Summary of Stream Miles by Stream Classification, and Miles and Percentage of Stream with Adjacent Harvest<sup>1</sup>**

VCU	Class I <sup>2</sup>	Class II <sup>2</sup>	Total	Percent Cut <sup>3</sup>
<i>National Forest Land</i>				
203	7.0 (0.8)	22.8 (0.4)	29.8	4.0
204	21.8 (1.0)	52.3 (0.3)	74.1	1.8
205	1.3	7.0	8.3	0
207	0.2	12.3	12.5	0
208	5.5	3.2	8.7	0
209	11.2 (0.1)	8.7 (1.4)	19.9	7.5
210	16.1	10.1	26.2	0
211	0	0	0	0
212	7.6	4.0 (0.4)	11.6	3.4
213	0.5	0.7	1.2	0
214	1.5	1.1 (0.2)	2.6	7.7
215	13.0 (3.1)	13.6 (1.7)	26.6	18.0
216	0	3.1 (1.6)	3.1	51.6
217	8.4 (4.6)	3.6 (1.6)	12.0	51.6
218	13.7 (1.8)	6.7 (0.2)	20.4	9.8
219	0.5 (0.3)	6.8 (0.5)	7.3	11.0
220	12.5 (1.9)	29.3 (0.8)	41.8	6.5
221	<u>0.5</u>	<u>12.8</u> (1.1)	<u>13.3</u>	<u>8.3</u>
Subtotal	121.3 (13.6)	198.1 (10.2)	319.4	7.5
<i>Native Corporation Land</i>				
204	6.5	12.3	18.8	0
205	8.6	11.5	20.1	0
206	1.0	9.3 (1.1)	10.3	10.7
207	10.2 (4.1)	16.0 (6.0)	26.2	38.5
208	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Subtotal	26.3 (4.1)	49.1 (7.1)	75.4	49.2

(Continued)

locations and classifications are also available in the planning record maps at the Chatham Area Supervisor's office.

### Stream Temperature

Summer temperatures in main channel streams in the study area normally range from 37 degrees to 52 degrees Fahrenheit, but may occasionally exceed 60 degrees. The frequent cloudiness, low air temperatures, steep channel gradients, and frequent precipitation that characterize this region keep summer stream temperatures below the range considered harmful to fish

### 3 Affected Environment

Table 3-24 (Continued)

#### Summary of Stream Miles by Stream Classification, and Miles and Percentage of Stream with Adjacent Harvest<sup>1</sup>

VCU	Class I <sup>2</sup>	Class II <sup>2</sup>	Total	Percent Cut <sup>3</sup>
<i>Tenakee Springs and State of Alaska Land</i>				
219	0.2	0.6	0.8	0
220	1.8	4.5 (0.8)	6.3	12.7
221	<u>0.2</u>	<u>0.3</u>	<u>0.5</u>	<u>0</u>
Subtotal	2.2	5.4 (0.8)	7.6	10.5
Total	149.8 (17.7)	252.6 (18.1)	402.4	8.9

SOURCE: APC 1986-90 Operating Plan EIS Resource Report, Fisheries and Hydrology, April 1983, unpublished. USFS Region 10, Juneau, AK.

<sup>1</sup> Figures in parentheses are miles of stream class cut to one or both sides by 1988.

<sup>2</sup> Stream segments labeled as Class I have anadromous fish; Class II have resident fish.

<sup>3</sup> This value reflects the percentage of stream habitat logged to the stream bank as of 1988.

most of the time. However, fish kills due to high temperature have been documented in southern Southeast Alaska. In Analysis Area 3, there have been no documented fish kills due to stream temperature. Factors that could lead to these events include extended dry and low-flow periods, high air temperatures, and large salmon runs that become isolated in stream pools within the intertidal area. Valley and stream riparian characteristics, and the presence of lakes, may also play a part in these fish kills. Streams with extensive lakes or muskegs along their courses are more likely to have high temperatures if forests are cut without leaving riparian vegetation to provide shade.

Winter stream temperatures range from 32 degrees to 37 degrees. Cold winter temperatures may be an important limiting factor to fish production. A two- to six-week period of sustained subfreezing weather generally occurs annually between November and February in Southeast Alaska. The combined effects of severely reduced stream runoff and low air temperature can cause freezing of stream surface and intergravel water. Low temperature problems are generally most acute under conditions of: elevations above 200 feet, low surface runoff, streams with little ground-water recharge, and little or no snow cover. Streams located in alluvial bottom-lands with significant ground-water recharge are least susceptible to low temperature problems.

#### Sediment

Soil erodability in this region is relatively low. Natural sediment yields vary greatly throughout the year, as storms affect areas of chronic natural streambank erosion and mass failure. Steeper slopes have a greater potential to produce sediment when subject to activities such as road construction and timber harvesting. Not all debris from mass failure reaches a stream channel; some is deposited on-site, at the foot of a slope. This material contributes to the development of colluvial soils, which are part of the natural landform.

Sediment can move to a stream channel, either suspended in water or as a mass. The amount of sediment which is suspended or deposited in a channel at a given time depends on the amount of debris, the amount of streamflow, and channel characteristics. Mass failures, or landslides, often occur naturally, and can be several acres in size. Sediment can severely affect water quality in a stream, but the effect is temporary, and decreases as higher streamflows move the material downstream. Almost all of the fine material which enters a channel will eventually move through the system and be deposited in estuaries.

## Streamflow

Runoff per square mile is relatively high in this area. Due to the frequency of rainfall and its distribution throughout the year, perennial streams are common. Drainage density is high, with a vast network of small channels feeding into larger streams.

Peak streamflow typically occurs with heavy precipitation in the fall. Low flows occur in late December through April, due to freezing weather, and also occur in dry summer months. Occasional storms throughout the year can cause minor increases in streamflow.

## Marine Environment

Approximately 48,000 kilometers (30,000 miles) of tidal shoreline, roughly 60 percent of the total Alaskan coast, comprises Southeast Alaska's coastline. Within this region occurs a great diversity of habitats that collectively account for the complexity of Southeast Alaska's estuarine and tidal environments.

The marine environment encompasses a wide variety of ecosystems. The intertidal and subtidal marine environments are subject to effects from log transfer and storage facilities, since those are the points of concentrated activity associated with the marine transportation of logs. The preferred sites for log transfer facilities, log storage areas, camp settlements, and anchorages are deep bays, or along straits or channels. Other marine areas are not addressed here because they are not expected to be affected by activities associated with the timber harvest being evaluated in this SEIS. Activities outside the areas of concentration are widely dispersed and any potential effects would be short-term and/or diluted below detectable thresholds. This document describes the current conditions at the existing Long Island and Kennel Creek LTFs as a basis for evaluating the increment impacts associated with the alternatives for completing the 1986-90 Operating Period. It also addresses the Seal Creek and False Bay areas where new log transfer facilities are proposed.

The shallow marine waters and associated mud flats and estuaries that are found in the protected coves and bays provide vital habitat for some important species, such as Dungeness crab and juvenile salmon. They are part of a complex and dynamic ecosystem that includes shrimp, flatfish, marine worms, echinoderms, sponges, sea anemones, shellfish, plankton, marine algae, and other organisms.

The potential impacts that are of concern at log transfer sites relate primarily to the deposition of bark. Laboratory tests show that bark deposits may be a source of toxic organic leachates that may be deleterious to salmon fry and crab larvae. The accumulated bark may also smother benthic organisms. The rate of bark accumulation varies with conditions at each facility. The design of the facility partially determines the amount of bark lost (directly associated with the speed of log entry into the water), and the configuration of the location determines the dispersion of the bark by currents and winds. Log raft storage areas accumulate bark at a much slower rate than the immediate area of the log transfer facility. Little quantified information is available that documents decomposition, flushing, recovery times, recolonization rates, or other information about the longevity of bark and its effects on the marine benthic habitat.

An effect of bark and debris accumulation is that little-neck clams and bay mussels have been shown to be eliminated when as little as 4 to 5 inches of bark accumulated (Freese and O'Clair 1984, 1987). Further, Conlan and Ellis (1979), Karau (1975), and Jackson (1986) reported mollusca and several polychaetes were excluded by bark debris greater than 2.5 centimeters in thickness, and the effects of bark may last several decades. Deposition of more than a 1-centimeter layer of wood waste has been observed to produce losses of suspension feeding benthos, with major community composition changes at 5-centimeter accumulation (Conlan and Ellis 1979). In 15-centimeter deposits, suspension feeding organisms were absent and the area was dominated by a few abundant deposit feeding organisms. It can be assumed that other plants and animals that live in and on the bottom would be similarly affected.

### 3 Affected Environment

Marine Coastline near Spasski Bay.



Toxic substances, occurring as leachates from bark, precipitate in saltwater; therefore, leachates do not appear to be a major problem in open water or where good circulation exists (Gibbons 1982, Sedell and Duval 1985). Recently, dissolved substances, such as hydrogen sulfide and ammonia, have been shown to occur in the interstitial water of bark deposits when bark accumulates on the bottom (O'Clair and Freese 1984, Freese and O'Clair 1985). These substances remain within the bark and do not go into solution. However, if Dungeness crabs burrow into the bark deposit, a decrease in reproductive fecundity, egg maturation, eating habits, and overall survival can be demonstrated (O'Clair and Freese 1985). This effect has been observed in only one bark accumulation in the field (Rowan Bay log transfer facility) since crabs did not come into direct contact with bark accumulations at a number of other log transfer facility locations that were studied (O'Clair and Freese 1984, 1988). Studies have demonstrated that waste wood leachates are toxic in concentrated form to fish and shellfish, such as shrimp and salmon. However, in the natural environment, toxic concentrations should not be reached due to adequate flushing and circulation. Regulations requiring monitoring of bark and wood accumulation help minimize damage to the marine environment.

Other effects associated with existing log transfer facilities relate to oil, grease, and petroleum pollution. The source of these contaminants may be the operation and maintenance of equipment used in log handling and transfer operations. Persistent loss of small volumes of petroleum products is a concern, as water soluble compounds have been shown to be toxic to marine larvae and eggs at concentrations of 0.1 mg/l. Daily monitoring for the presence of any visible oil sheen on the water is often a permit requirement.

Both the Long Island and Kennel Creek facilities have been in operation long enough that deposited bark would be a feature at these sites. Freese (1987) indicates that once benthic deposits of bark are in place, they are very resistant to decomposition or transport away from the immediate area. Therefore, bark deposits are expected to be present even at log transfer facilities that have not been in operation recently. However, the area impacted by bark is rela-

tively restricted, for example, at 13 LTFs evaluated in Southeast Alaska, bark deposits averaged 2.4 acres per site (Freese 1987).

A log transfer facility was constructed in 1989 at Seal Creek (VCU 213) on Freshwater Bay. Construction of this LTF will result in the loss of approximately 1.2 acres of natural benthic habitat which will be covered by rock fill. Impacts from construction of this log transfer facility were discussed in the Seal Creek Environmental Assessment in Appendix B-1 of the Draft SEIS. That environmental assessment has been approved and the appropriate permits for construction have been issued. Once the Seal Creek LTF goes into operation a bark deposit would develop. Bark deposits at Seal Creek will probably be similar to deposits at other log transfer facilities in sheltered bays in Southeast Alaska, such as the Kennel Creek LTF.

A fourth log transfer facility was constructed at False Bay in 1989. Construction of this LTF will result in the loss of approximately 0.4 acres of natural benthic habitat which will be covered by rock fill and adjacent scouring and compaction. Impacts from construction of this log transfer facility are discussed in the False Bay Environmental Assessment in Appendix B-1 of the Draft SEIS. That environmental assessment has been approved and the appropriate permits for construction have been issued. Once the False Bay LTF goes into operation a bark deposit would develop. The bark deposits at False Bay are expected to be smaller than average because of the high flushing rates in the Bay and because the bark will be removed from the slide area on a regular basis.

A log transfer facility in Whitestone Harbor was approved as part of the 1981-86 Operating Plan and also included in the 1986-90 Plan, although APC has not elected to construct the facility to date. As part of the settlement agreement in *Hanlon v. Barton*, APC and the Forest Service agreed to defer construction of this LTF pending further analysis in the SEIS. The Regional Forester's decision in March 1989 to permit APC to construct a seasonal, short-term LTF in False Bay has reduced the need for a LTF in Whitestone Harbor. Because of expressed concerns regarding the Whitestone Harbor LTF, and the reduced need for the facility as a result of the decision to approve a LTF in False Bay, none of the alternatives examined in the SEIS include the Whitestone Harbor facility. Further analysis of the need for, and impacts of, this facility may take place as part of subsequent project proposals in the future.

## Land Status

This section presents descriptions of current land ownership and uses.

### Private Lands

Within Analysis Area 3 there are five parcels of private land. Native corporations, Huna Totem Corporation and Sealaska Corporation, own land at East Port Frederick (VCUs 204, 205, 206, 207, and 208) and small parcels at Coffee Cover (VCU 219) and Gypsum Creek (VCU 212). Although the exterior boundaries of these parcels have not been completely surveyed, Huna Totem Corporation owns approximately 17,399 acres and Sealaska owns approximately 12,682 acres. In addition, the City of Tenakee Springs and/or the State of Alaska own approximately 4,055 acres in VCUs 219, 220, and 221.

### State Selections

There are three State selections in Analysis Area 3, located at Game Point (VCU 204), Freshwater Bay (VCU 215), and Pavlov Lake (VCU 218), and near the City of Tenakee Springs (VCUs 219, 220, and 221). Both Freshwater Bay and Tenakee Springs selections have been conveyed, while Pavlov Lake has not.

### Native Selections

In VCUs 203, 204, 205, 207, 208, and 209, there are unconveyed lands selected by Sealaska Corporation and Huna Totem Corporation that have been set aside for Native selection under ANCSA. According to the Forest Service's Long-Term Timber Sale Contract with Alaska Pulp Corporation, these VCUs are timber sale contingency areas. Timber harvest would be

### **3 Affected Environment**

scheduled in the contingency area if the agreed volume of timber cannot be obtained from the primary sale area. Before timber harvest can take place on lands within a contingency area selected by a Native Corporation, yet unconveyed, a written agreement must be obtained from the affected corporation(s), as per Section 908, ANILCA.

#### **Native Allotments**

There is one active unconveyed Native Allotment application, located at False Bay, in VCU 210.

#### **Withdrawals**

Four areas have been withdrawn for lighthouse reserves in Analysis Area 3. They are located at Inner Point Sophia (VCU 206), Spasski Island (VCU 207), Point Augusta (VCU 211), and Grave Island (VCU 220).

#### **Mining Claims**

Within four sections in VCU 212, there is a block of unpatented mining claims known as the Gypsum Claims. Three claims are located in T45S, R64E, Sec. 36, CRM; 8 claims are located in T46S, R64E, Sec. 1, CRM; 3 claims are located in T45S, R65E, Sec. 31, CRM; and three claims are located in T46S, R65E, Sec. 6, CRM.

#### **Special Use Permits**

Eight special use permits have been issued for the following improvements within Analysis Area 3: trails and a shelter near Game Point (VCU 204); a church near Game Point (VCU 204); a navigation aid on Spasski Island (VCU 207); a shelter at Iyoukeen Cove (VCU 212/213); an isolated cabin near the mouth of Kennel Creek (VCU 215); a helicopter landing site near the mouth of Kennel Creek (VCU 217); an isolated cabin north of Pavlof Harbor (VCU 218); and an isolated cabin at Wachusett Cove (VCU 218).

#### **Rights-of-Way Acquired**

The USDA Forest Service holds the following Alaska State Department of Natural Resource easement grants for log transfer facilities:

1. Kennel Creek (VCU 217) - ADL 100238, expires 1/12/2018. DOA Permits are Chatham Strait 77 and 99.
2. Whitestone Harbor (VCU 209) - ADL 102379, expires 11/8/2012. DOA Permit is Icy Strait 7 and the facilities must be constructed by 4/14/90, unless the date is extended.
3. Seal Creek (VCU 213) - ADL 104956, expires 8/18/2008. DOA Permit is Chatham Strait 90 and the facilities must be constructed by 1/18/91 unless the date is extended.



Huna Totem Corporation holds an Alaska State Department of Natural Resources lease for the log transfer facilities at Long Island on Huna Totem Corporation lands (VCU 204) - ADL 102830, expires 10/31/2015. DOA Permit is Port Frederick 47.

The USDA Forest Service also holds the following easements:

1. Under the Huna Road Right-of-Way Cost Share Agreement, easements for use of the log transfer facilities and roads on Huna Totem Corporation lands.
2. Under the Huna/Sealaska Road Right-of-Way Cost Share Agreement, easements for use of the roads on Sealaska Corporation land.
3. Under Section 17(b) ANCSA, public easements for use of roads on lands recently conveyed for which the Forest Service has not acquired cost-share easements under the Forest Road and Trail Act.

#### **Logging Camps**

Two logging camps exist in Analysis Area 3: one at Kennel Creek (VCU 217) and one near Long Island (VCU 205). The logging camp at Kennel Creek is authorized along with the existing LTF at Kennel Creek on an Alaska Department of Natural Resources Tideland easements.

These facilities are on Forest Service land. The log transfer facility and logging camp at Long Island are on Sealaska Corporation land and the Alaska Pulp Corporation has reserved a third-party interest under their Long-Term Timber Sale Contract and special use permit for use of the logging camp and access road on Sealaska Corporation land.

## Recreation

### Current Use

Like much of the forested areas in Southeast Alaska, recreation use depends entirely on availability of access to the area by boat, air, or vehicle. VCUs 204 through 210, 212, 215, and 217 through 219 can be accessed by road from Hoonah. Because Hoonah is regularly serviced by the Alaska Marine Highway System, these VCUs may be used by the general public for roaded recreation. A road system from Sunny Cove near Tenakee Springs, provides access to VCUs 216 and 220. Tenakee Springs is serviced by the Alaska Marine Highway System to foot traffic only, limiting motorized recreational use of these roads to members of the Tenakee Springs community. Logging roads are located in VCUs 213 and 214; however, they are not connected to any population centers and are only accessible by boat, limiting their use for recreation to foot travel or small off-road vehicles (ORVs) and all terrain bicycles that can be brought in by boat. Unroaded portions of the area may be accessed by boat or air taxi service.

Although Analysis Area 3 is fairly accessible for recreation compared to other areas of the Tongass National Forest because of its scheduled Alaska Marine Highway service. However, it is currently used primarily by residents of Hoonah, Tenakee Springs, and the Kennel Creek logging camp, which is currently occupied year round. Popular recreation activities in Analysis Area 3 include prospecting, camping, fishing, hiking, hunting, and boating, including kayaking. In addition, the roads systems out of Hoonah and Tenakee Springs are widely used for conventional recreation and ORV travel. Other recreational activities occurring in this area include sightseeing of wildlife and scenery, beachcombing, small game hunting, cross country skiing, and gathering of forest products.

### Recreation Opportunities

The Recreation Opportunity Spectrum (ROS) classification is a method used to classify areas of the Tongass National Forest into similar recreation areas based on a combination of activities, settings, and associated user experiences. Each similar area is placed in an ROS class that ranges from the least developed “primitive” class to a more developed “rural” class. An



Fishing is a Popular Recreation Activity in Southeast Alaska.

### **3 Affected Environment**

area rated “primitive” provides for activities in the most remote and least accessible settings. Areas classed “semi-primitive” are less remote and provide easier access. The semi-primitive classification has been divided into motorized and nonmotorized. These classifications are influenced by the presence of motorized boats as well as off-road vehicles. The “roaded” classes reflect a higher degree of development and provide a setting for motor vehicle recreation activities.

The ROS classification system was used to inventory recreation opportunities in Analysis Area 3. Table 3-25 presents the acreage of land in each ROS class by VCU. Currently, 133,048 acres of Analysis Area 3 are classified as semi-primitive nonmotorized. The roaded modified class covers 58,128 acres. The acreage in remaining ROS classes drops significantly from the above two classes with 13,273 acres of semi-primitive motorized, 10,645 acres of roaded natural, and 408 acres of rural. No land in Analysis Area 3 has been classified as primitive. Expected future trends in recreation use are described in Chapter 4, Environmental Consequences.

#### **Recreation Sites**

Recreation sites identified by the Forest Service in Analysis Area 3 include designated anchorages at Whitestone Harbor in VCU 209 and Pavlof Harbor in VCU 218. Other various cabins, shelters, and trails are allowed in Analysis Area 3 by special use permit and are discussed in Chapter 3, Land Status.

## **Visual Resources**

In order to understand the visual resource inventory and management on the Forest, definitions for the following terms are useful.

The Existing Visual Condition is an assessment of the level of visual quality that presently exists. The Existing Visual Condition may range from Type I, where little or no human modification is apparent, to Type VI, where man-made changes in the landscape are in glaring contrast to the natural landscape. All of the Existing Visual Condition classes are further defined in the glossary.

For Analysis Area 3 and each VCU, the acreage in each Existing Visual Condition class is



*Tenakee Inlet is a Popular Recreational Use Area.*

described in Table 3-26. The Existing Visual Condition of Analysis Area 3 reflects the implementation of Alternative J selected from the APC 1986-90 FEIS.

Visual Quality Objectives (VQOs) are visual resource management goals for National Forest System lands. They are based upon the variety in the landscape, the distance between the landscape and the people viewing it, and how much the landscape is viewed by people. The VQOs include Preservation, Retention, Partial Retention, Modification, and Maximum Modification and are defined in the glossary. Generally, 48.2 percent of Analysis Area 3 exists in a natural condition (EVC Type I), while .8 percent is in heavily altered condition (EVC Type IV). The remaining 51 percent is in a slightly to moderately altered condition (EVC Type II to IV).

In consultation with Forest Managers, the visual resource specialist has evaluated VCUs in Analysis Area 3 and assigned VQOs to each (Table 3-27). The assigned VQOs consider other resource values, including timber and the planned management direction indicated by TLMP. Assigned VQOs provide a baseline from which to measure changes for use in managing National Forest Lands. The assigned VQOs are based upon the variety in the landscape, the distance between the landscape and the viewers, and how much the landscape is viewed. As part of the visual inventory, Sensitivity Levels were mapped, completing the VQO mapping in the Tongass National Forest. The Sensitivity Level maps were approved by Regional Forester John

Table 3-25

### Existing Recreation Opportunity Spectrum Classes in Acres<sup>1</sup>

VCU	Primitive I	Semi-Primitive	Semi-Primitive	Roaded Natural	Roaded Modified	Rural
		Non-Motorized	Motorized			
203	0	6,848	253	1,410	274	0
204	0	14,537	0	3,176	4,692	0
205	0	4,290	0	1,690	5,530	30
207	0	10,310	20	310	20	0
208	0	2,723	1,287	0	1,015	0
209	0	7,143	727	0	7,642	0
210	0	11,350	975	2,836	5,537	0
211	0	3,220	1,468	0	0	0
212	0	8,109	376	0	4,845	0
213	0	1,537	1,850	0	444	0
214	0	4,630	180	0	2,043	0
215	0	14,325	1,415	0	7,375	28
216	0	8,270	0	0	2,490	0
217	0	6,066	882	0	3,284	0
218	0	9,196	1,006	251	8,413	0
219	0	3,811	53	842	1,184	90
220	0	12,780	130	130	4,940	260
221	0	3,104	1,850	0	0	0
Total	0	132,249	12,472	10,645	59,728	408

SOURCE: Forest Service ROS database, Chatham Area Supervisor's Office, Sitka, AK.

<sup>1</sup> National Forest land.

### 3 Affected Environment

Sandor in 1980. (See the glossary for a full definition of Sensitivity Levels). The Sensitivity Level map provides the basis for the Inventory VQOs and visual quality management on the Forest.

Since the TLMP was completed in 1979, prior to implementation of the Visual Management System on the Forest, VQOs were not assigned to specific sites in that document. TLMP did, however, delineate Land Use Designation (LUD) classes, designating emphasis on amenity values in some areas, and commodity values in others. In order for this document to be responsive to the TLMP, a general rule was developed using the LUD classes: in areas classified LUD 3, where amenity values are to be emphasized, changes from the assigned VQOs should be minimal; in areas classified LUD 4, where commodity values are emphasized, changes in assigned VQOs are allowed greater flexibility to meet the intent of the TLMP. In Analysis Area 3, VCUs 211, 213, 215, 218, 219, and 220 are classified as LUD 3, and the remaining VCUs are classified as LUD 4.

Variety Classes are also considered when assigning VQOs and in making management decisions. Variety Class A refers to “distinctive landscapes” where features of land form, vegetation patterns, water forms, and rock formations are of unusual and outstanding visual quality. Variety Class B refers to “common landscapes” where features contain variety in form, line, color, and texture, or combinations thereof, but which tend to be common throughout the

Table 3-26

#### Existing Visual Condition (EVC) in Acres<sup>1</sup>

VCU	EVC Classes (Type) <sup>2</sup>				
	I	II	III	IV	V
203	6,515	1,954	0	316	0
204	18,933	0	0	3,472	0
205	1,024	0	0	4,395	0
207	10,705	0	0	96	260
208	2,764	0	0	2,261	0
209	2,571	0	0	0	12,941
210	7,669	0	0	13,029	0
211	4,688	0	0	0	0
212	3,650	0	2,133	7,547	0
213	2,151	0	0	1,680	0
214	2,843	0	0	4,010	0
215	7,554	0	0	15,589	0
216	2,475	0	8,285	0	0
217	2,149	0	0	8,083	0
218	4,339	0	0	14,527	0
219	3,663	0	1,650	667	0
220	12,850	0	0	0	5,067
221	4,449	0	0	259	0
Total	100,992	1,954	12,068	75,931	18,268

Source: SEIS Planning Record.

<sup>1</sup> National Forest land. EVCs range from Type I for the most natural appearing views, to Type VI, where man-made changes are grossly obvious and contrast sharply with the natural scenery. See the Glossary for detailed definitions of each class.

<sup>2</sup> No Type VI EVC class occurred in Analysis Area 3.



*Forest Service Interpreter Directs Tourists' Attention to a Point of Interest.*

Table 3-27  
**Assigned Visual Quality Objectives in Acres<sup>1</sup>**

VCU	Retention	Partial Retention	Modification	Maximum Modification
203	0	0	5,518	3,26
204	0	3,300	9,363	9,742
205	0	2,296	2,535	588
207	0	4,042	4,606	2,413
208	0	678	4,347	0
209	0	3,822	9,052	2,638
210	0	5,918	7,387	7,393
211	0	0	4,688	0
212	0	3,339	4,794	5,197
213	0	0	3,831	0
214	0	2,547	2,889	1,417
215	0	6,004	9,533	7,606
216	0	573	7,817	2,370
217	0	0	8,304	1,928
218	0	3,592	10,555	4,719
219	1,113	4,588	279	0
220	3,657	7,604	486	6,170
221	0	0	4,572	136
Total	4,770	48,303	100,556	55,584

SOURCE: SEIS Planning Record.

NOTE: Data reflects the no action/current direction described in Chapter 2.

<sup>1</sup> National Forest land. No acreage was assigned a preservation objective.

### 3 Affected Environment

character type. Variety Class C refers to “minimal” landscapes where there are little changes in form, line, color, and texture. Variety Class C landscapes are naturally monotonous and often improved by modification.

This section presents an updated summary of the visual resource inventory that was conducted for Analysis Area 3 for the APC 1986-90 FEIS. A complete description of the original visual resource inventory can be found in the Resource Report for the Visual Resource, Sitka and Hoonah Ranger Districts, Chatham Area, Tongass National Forest, APC 1986-90 Operation Period EIS, dated February 23, 1983; and in the Resource Report Addition dated January 6, 1984 (Forest Service 1983c, 1984b). The following summary of the existing visual resource has been updated to reflect actions that have taken place in Analysis Area 3 since 1984 and to include VCUs that have been added to the analysis area.

VCU 203: Sixty percent of this VCU is visible as middleground from small boat and plane routes in Port Frederick, assigned Sensitivity Level 2. Variety Class ratings are C in the lower reaches of Seagull Creek and B in the upper reaches. Assigned VQOs are 63 percent modification and 37 percent maximum modification. The Existing Visual Condition is 74 percent Type I, 22 percent Type II, and 4 percent Type IV.

VCU 204: Fifty-two percent of this VCU is visible as middleground and 34 percent is visible as foreground from the Sensitivity Level 2 road in Game Creek and marine travel routes in Port Frederick. Six percent is also visible as middleground from Hoonah, assigned Sensitivity Level 1. Eight percent of the VCU is unseen from any inventoried travel routes. Variety Class ratings are generally C in the Game Creek area, B in the more varied southern portions of the VCU, and A in the steep high mountains along the eastern boundary. Assigned VQOs are 15 percent partial retention, 42 percent modification, and 43 percent maximum modification. The Existing Visual Condition is 85 percent Type I and 15 percent Type IV.

VCU 205: The majority of this VCU falls within private ownership, much of which has been altered over time. For the most part, the remaining parcels of National Forest System lands are unseen or seldom seen from recognized travel routes and use areas in the Port Frederick area. The primary exception to this is the upper elevations of Elephant Mountain which remains within the National Forest System. Assigned VQOs are 42 percent partial retention, 47 percent modification, and 11 percent maximum modification. The Existing Visual Condition of the National Forest System lands is 19 percent Type I and 81 percent Type IV.

VCU 207: As with VCU 205, the majority of VCU 207 falls within private ownership, including most of the Spasski Creek drainages. Much of this land has been altered and will probably continue to be altered over time. The National Forest System lands are primarily visible as middleground from Alaska Marine Highway and small boat route in Icy Strait, assigned Sensitivity Level 1. The area is also visible in the foreground and middleground from the Sensitivity Level 2 roads accessing the Spasski Creek drainage and many areas in eastern Chichagof Islands. Variety Class ratings are mostly Class B with some areas in the upper elevations rated as Class A. Assigned VQOs are 36 percent partial retention, 42 percent modification, and 22 percent maximum modification. The Existing Visual Condition of the National Forest System lands is 97 percent Type I, 1 percent Type IV, and 2 percent Type V.

VCU 208: Ninety-six percent of this VCU is visible as middleground and 4 percent is visible as foreground from the Sensitivity Level 1 Alaska Marine Highway and small boat routes in Icy Strait. Variety Class ratings are A along with shoreline of Icy Strait, C in the gently sloping portions, and B in the more topographically varied portions of the VCU. Assigned VQOs are 13 percent partial retention and 87 percent modification. The Existing Visual Condition is 55 percent Type I and 45 percent Type IV.

VCU 209: Fifty-five percent of this VCU is visible as middleground and 8 percent is visible as foreground from the Alaska Marine Highway and small boat routes in Icy Strait, assigned Sensitivity Level 1. Fourteen percent of the VCU is also visible as foreground and 7 percent is visible as middleground from the Sensitivity Level 2 logging road running through the VCU.



*Visual Effects Are Considered During Project Planning.*

Sixteen percent of the VCU is unseen from inventoried travel routes. Variety Class ratings are A in the Whitestone Harbor area due to the unique cliffs and tidal area and the peaks of the southwest portion of the VCU, B in the moderately varied mountainside slope areas, and C in the streamside areas. Assigned VQOs are 25 percent partial retention, 58 percent modification, and 17 percent maximum modification. The Existing Visual Condition is 6 percent Type I and 94 percent Type V.

VCU 210: Thirty-nine percent of this VCU is visible as middleground and 28 percent is visible as background from the Alaska Marine Highway and small boat routes in Icy and Chatham Straits, assigned Sensitivity Level 1. Fifteen percent is also visible in the foreground and 11 percent as middleground from the Sensitivity Level 2 logging road which traverses the VCU. Seven percent of the VCU is unseen from inventoried travel routes. Variety Class ratings are generally C in the uniformly covered lower elevations and A in the Sonyakay Ridge area. A few shoreline areas and areas adjoining VCU 211 are rated as B. Assigned VQOs are 28 percent partial retention, 36 percent modification, and 36 percent maximum modification. The Existing Visual Condition is 28 percent Type I and 72 percent Type IV.

VCU 211: The middleground of this VCU is 100 percent visible from the Sensitivity Level 1 Alaska Marine Highway and small boat routes in Icy and Chatham Straits. Variety Class ratings are generally B in the shoreline and moderately sloping areas and C in the more uniformly vegetated and sloping areas. Assigned VQOs are 100 percent modification. The Existing Visual Condition is 100 percent Type I.

VCU 212: Forty percent of this VCU is visible as background and 12 percent is visible as middleground from the Sensitivity Level 1 Alaska Marine Highway and small boat routes in Chatham Strait. In the upper reaches of Wukuklook Creek, 13 percent of the VCU is also visible as background and 31 percent is visible as middleground from the Sensitivity Level 2 trail and use area. Four percent of the VCU is unseen from inventoried travel routes. Variety Class ratings are generally A in the Sonyakay Ridge and upper portions of Wukuklook Creek areas, B throughout the upper reaches of Gypsum Creek, and C throughout the lower reaches of Gypsum and Wukuklook Creeks. Assigned VQOs are 25 percent partial retention, 36 percent modification, and 39 percent maximum modification. The Existing Visual Condition is 29 percent Type I and 71 percent Type IV.

### 3 Affected Environment

VCU 213: This VCU is predominantly visible as middleground from the Sensitivity Level 1 Alaska Marine Highway and small boat routes in Chatham Strait. Variety Class ratings are C on the Iyoukeen Peninsula from North Passage point to the area north of the Redcliff Islands and B on the remainder of the VCU. Assigned VQOs are 100 percent partial retention. The Existing Visual Condition is 72 percent Type I and 28 percent Type IV.

VCU 214: Fifteen percent of this VCU is visible as middleground from the Sensitivity Level 2 small boat route in Freshwater Bay and boat anchorage and use area at Kennel Creek. Six percent is visible in the background from the Sensitivity Level 1 small boat route in Chatham Strait. Seventy-nine percent of this VCU is unseen from inventoried travel routes. Variety Class ratings are generally A in the upper elevations, C in the lower drainages, and B in the midslope areas. Assigned VQOs are 37 percent partial retention, 42 percent modification, and 21 percent maximum modification. The Existing Visual Condition is 41 percent Type I and 59 percent Type IV.

VCU 215: Thirty-two percent of this VCU is visible as foreground and 33 percent is visible as middleground from the Sensitivity Level 2 small boat route in Freshwater Bay and the logging road leading out of Kennel Creek. Twenty-four percent is visible as background from Sensitivity Level 1 small boat route in Chatham Strait. Eleven percent of the VCU is unseen from inventoried travel routes. Variety Class ratings are A in the high ridges on the south side of the north fork of Freshwater Creek, B on the slopes to the north side, and generally C adjacent to the creek bed. The most southern drainage of this VCU is also rated B. Assigned VQOs are 26 percent partial retention, 42 percent modification, and 33 percent maximum modification. The Existing Visual Condition is 35 percent Type I and 65 percent Type IV.

VCU 216: Seventy-six percent of this VCU is visible as middleground and 5 percent is visible as foreground from the use areas at Kennel Creek and the scenic alpine ridges along the northern boundary of the VCU, both rated as Sensitivity Level 2. Nineteen percent of the VCU is unseen from inventoried travel routes. Variety Class ratings are predominantly B, although some of the more uniform lower elevations attain a C rating and some of the more varied higher elevations attain an A rating. Assigned VQOs are 5 percent partial retention, 73 percent modification, and 22 percent maximum modification. The existing Visual Condition is 23 percent Type I and 77 percent Type III.

VCU 217: Visibility to this VCU is complex due to the various inventoried routes in the area. Three percent is visible as foreground and 18 percent is visible as middleground from the Sensitivity Level 1 boat route and anchorage in Cedar Cove. Another 10 percent is visible as foreground and 44 percent as middleground from the Sensitivity Level 2 boat route to the head of Freshwater Bay, the anchorage at Kennel Creek, and the road system leading out of Kennel Creek. Twenty-five percent of the VCU is unseen from inventoried travel routes. Variety Class ratings are B in the side slopes of the Kennel Creek drainage, and generally C in the Pavlof Ridge area and lower elevations of Kennel Creek. Assigned VQOs are 81 percent modification and 19 percent maximum modification. The Existing Visual Condition is 21 percent Type I and 79 percent Type IV.

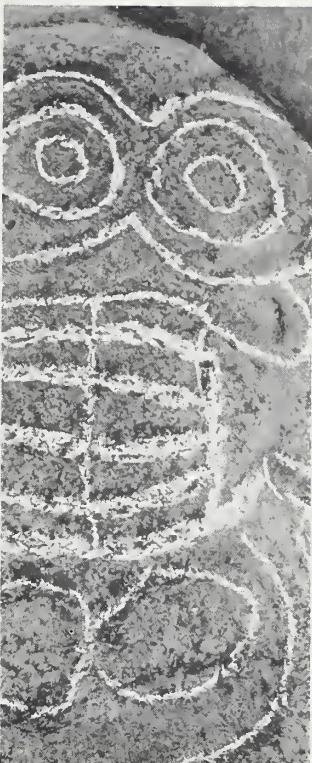
VCU 218: Like VCU 217, visibility to this VCU is complex due to the various inventoried travel routes. Forty-two percent of the VCU is visible as middle ground and 19 percent as foreground from the Sensitivity Level 2 road system within the VCU and the public use area at Pavlof Harbor. Nineteen percent of the VCU is visible as middleground, 10 percent in the background, and 4 percent in the foreground from the Sensitivity Level 1 routes in Chatham Strait. Six percent is unseen from inventoried travel routes. Variety Class ratings are A in the Wachusett Cove and Pavlof River areas, B in the more varied side slopes, and C in the more uniform side slopes. Assigned VQOs are 19 percent partial retention, 56 percent modification, and 25 percent maximum modification. The Existing Visual Condition is 23 percent Type I and 77 percent Type IV.

VCU 219: Sixty-seven percent of this VCU is visible as middleground, 19 percent as foreground, and 5 percent as background from the Sensitivity Level 1 Alaska Marine Highway and small boat routes traveling to Tenakee Springs. Nine percent is unseen from inventoried travel routes. Variety Class ratings are A in the area above Columbia Point, C in the lower drainages, and B in the remainder of the VCU. Assigned VQOs are 19 percent retention, 76 percent partial retention, and 5 percent modification. The Existing Visual Condition is 61 percent Type I, 28 percent Type III, and 11 percent Type IV.

VCU 220: A relatively small portion of this VCU falls within privately owned lands, that being within the boundaries of the town of Tenakee Springs. The majority of the VCU is National Forest System lands and is visible as middleground and background from the Sensitivity Level 1 Alaska Marine Highway and small boat routes in Tenakee Inlet. A small portion is also visible from the Sensitivity Level 1 Tenakee Hiking Trail and from the Sensitivity Level 2 small plane route along Tenakee Inlet. Variety Class ratings are Class A along the slopes nearest to Tenakee Inlet, Class C on most of the lower elevations along the Indian River drainage, and Class B on most mid- and upper-slope areas in the rest of the VCU. The assigned VQOs are 20 percent retention, 42 percent partial retention, 3 percent modification, and 35 percent maximum modification. The Existing Visual Condition of the National Forest System lands is 72 percent Type I and 28 percent Type V.

VCU 221: This VCU is predominantly visible as foreground and middleground from the Sensitivity Level 2 small boat and plane routes in Tenakee Inlet. A very small portion of the VCU nearest the town of Tenakee Springs is visible in the background from the Alaska Marine Highway as it approaches Tenakee Springs, assigned Sensitivity Level 1. The Variety Class rating is B for Admiralty to Chichagof Island. The assigned VQOs are 97 percent modification and 3 percent maximum modification. The Existing Visual Condition is 94 percent Type I and 6 percent Type IV.

## Cultural Resources



Cultural resources include the evidence of past human activity, dating from the first occupation of Southeast Alaska to the recent past. Information on the prehistory of the region is limited. Some sites in the region, including the Ground Hog Bay site on the Chilkat Peninsula and the Hidden Falls site on Baranof Island, indicate that the occupation of Southeast Alaska dates to nearly 10,000 years ago.

At the time of Euroamerican contact, the Hoonah and Angoon Tlingit used the Analysis Area 3 portion of Chichagof Island. Villages and sites for seasonal hunting, fishing, and collecting activities were located throughout the area. Recent historical activities in the area have included commercial fishing and canneries, fur farming, logging, limited hydroelectric power development, and some mineral exploration.

The Tongass National Forest has a diverse range of historic and prehistoric artifacts and sites, including for example: historic cabins, mines, ditches, mills, canneries, homesteads, fish camps, whaling stations, and Civilian Conservation Corps-era construction projects. Prehistoric sites include campsites, workshops, village sites, fort sites, rock shelters, fishing stations (weirs), petroglyphs and pictographs, and religious sites. Many of these properties are unique; they provide the only record of former habitats and past human activities, and they help us understand past human adaptation to the rigors of the northern Northwest Coast environment.

A cultural resources overview (Moss 1983, with additional supplements in 1984 and 1985) has been prepared to compile the recorded information relating to the past uses of the APC Contract area. Portions of the area within the study boundary have been surveyed on several occasions since 1974 by a number of investigators. Most of the field examinations were conducted in conjunction with other Forest Service activities such as the 1981-86 Long-Term

### **3 Affected Environment**

Sale Operating Period study. These surveys have determined the location and nature of many of the known cultural sites within the APC Contract area.

Environmental data, particularly geologic histories, are needed to understand past land use and site preservation conditions. This information has been combined with the literature and record search for the APC Contract area to locate cultural resource sites. Table 3-28 provides information on previous cultural resources surveys, while Figure 3-4 summarizes cultural resource sites for Analysis Area 3 VCUs. Information about known sites is contained in the Planning Record. Because of the sensitivity of cultural resource sites, these records are generally not available to the public.

## **Socioeconomics**

The socioeconomic environment affected by the proposed action includes the communities within or adjacent to the Analysis Area, the communities with forest production facilities that use the timber, and the communities whose residents visit the Analysis Area to hunt, fish, or pursue recreation. The communities near the Analysis Area include Hoonah, Tenakee Springs, Gustavus, Angoon, Kake, Skagway, and Sitka. Communities with production facilities that use timber from the APC long-term sale include Wrangell and Sitka. Hunters, anglers, and recreationalists from Juneau and other nearby communities use this Analysis Area, with access by private boats or float planes.

As a group, these communities form the larger part of what the State of Alaska Department of Labor refers to as Southeast Alaska or the Southeast Region. In general, employment, personal earnings, and the well-being of the population in the individual communities follows the rise and fall of economic activity in the Southeast Region as a whole.

### **Regional Economy**

The output of the Alaskan economy is dominated by the foreign export of fishery and forestry products, the sale of North Slope oil, and the accommodation of foreign and US visitors (Figure 3-5). Heavy dependence on global macroeconomic conditions increases the amplitude of the cyclical swings in employment relative to the rest of the United States and heightens the anxiety and concern of local residents. The private sector in Southeast Alaska is dominated by fishery and forestry exports, tourism, and the accommodation of visitors including anglers and hunters.

The public sector has a significant presence in the region. State and local government employment is heavily influenced by the level of oil royalties returned to the State from Federal leases of off-shore tracts. With the capital of Alaska in Juneau, the effects of changes in employment and earnings in state and local government are pronounced.

The dollar value of total output of goods and services from Alaska in 1986 was \$19.6 billion. Merchandise comprised \$1.3 billion or 6.6 percent of this output (US Department of Commerce, 1988). By comparison, the total US output in 1986 was valued at \$4.2 trillion, merchandise exports were \$227 million or 5.4 percent. In value, Alaska's trade in 1986 was led by fishery products (38.4 percent), oil and gas (22.6 percent), and wood products (19.9 percent). As mentioned, the dependence on export of natural resources makes Alaska and the Southeast Region vulnerable to global economic events. Figure 3-6 shows Gross State Product for the United States, the Far West (California, Nevada, Oregon, Washington, Alaska, and Hawaii), and Alaska as defined by the US Department of Commerce, Bureau of Economic Analysis. The percent change from year to year is calculated. The reaction of the Alaskan economy to the rise in oil prices from 1978-1982 is apparent as the value of Alaska's economic output grew faster than that of the US or the Far West. In 1983, the sharply rising dollar began cutting deeply into the competitiveness of Alaskan exports of natural resources. By 1985 the precipitous fall in the price of crude oil and the rise in the value of the dollar decimated Alaskan exports and Gross State Product contracted.

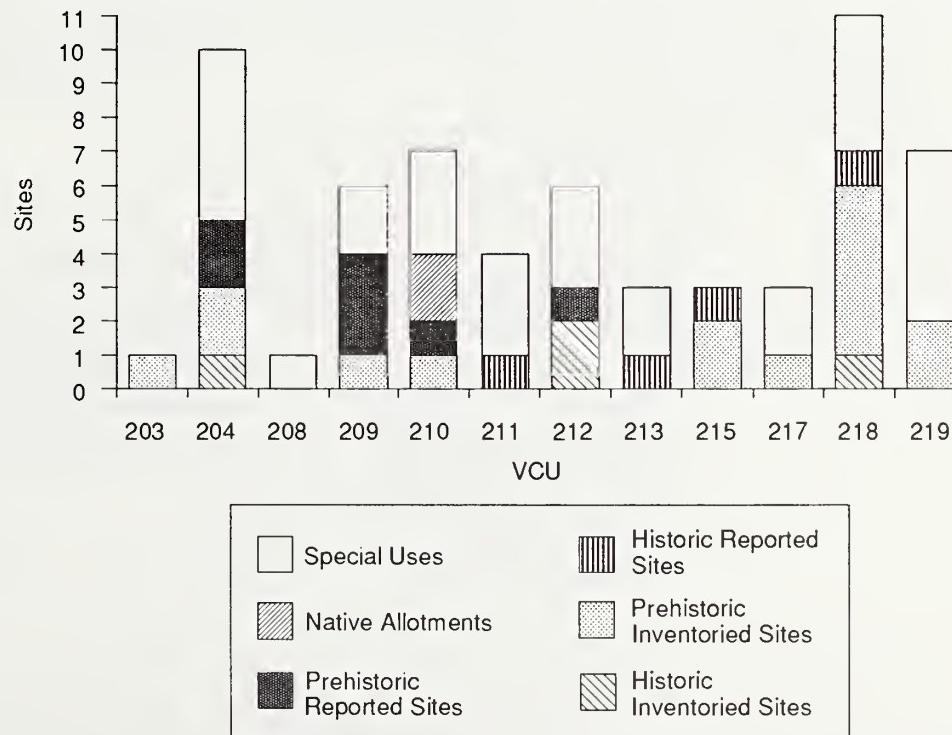
The sensitivity of the economy to foreign markets is also seen in Figure 3-7, which shows the consistent relationship between the quantity of Alaskan exports of forest products and indicators of the strength of the Japanese economy. Japan is the principal destination for Alaska's exports of forest products. As wood-using activity increases in Japan, Alaskan exports increase. Similarly, as the relative purchasing power of the Japanese increases (yen/dollar goes down) and the cost of Alaskan products declines (yen/dollar down), the quantity of Alaska's exports increases.

The dependence of the region's economy on foreign demand is widely understood in the local communities. This economic vulnerability heightens the desire both to broaden the base of economic activity and to stabilize the existing jobs through a continuity of resource supply. Although the employment fluctuation extends over the business cycle, communities experience greater change based on their economic orientation. For example, with its base in government, Juneau experiences little annual variation. Sitka, with employment led by the pulp mill, experiences slightly more annual change. In several of the other census areas, however, communities focused on logging and fishing face more change (Figure 3-8).

## Population

While population in the region has increased steadily with the growth in economic activity in Alaska (Table 3-29), the Southeast Region remains sparsely populated. Juneau grew at about the same rate as the State, while Southeast Alaska grew at slightly more than half the rate of the State and its capital. Among the areas affected by the proposed action, population in the Prince of Wales-Outer Ketchikan Census Area, Angoon, Hoonah, and Kake grew principally as a result of increased timber harvest and road construction activity. Growth in Gustavus came from increased tourism to Glacier Bay National Park. Elfin Cove, Pelican, and Port Alexander grew based on expanded fishing.

Figure 3-4  
Cultural Resource Sites



SOURCE: SEIS Planning Record.

### 3 Affected Environment

Table 3-28

#### Previous Cultural Resource Surveys

VCU	Previous Surveys	Recorded Sites	Reference <sup>1</sup>
203	Lower part of Seagull Creek and south shore of Port Frederick from drainage west to Seagull Creek - Reconnaissance Level	JUN 113 - Native Village Site	Autrey 1978 Fields & Davidson 1979
204	Parts of Game Creek, Long Island, Game Point, south shore of Port Frederick between Long Island and Game Creek - reconnaissance level; selected cutting units - complete level	JUN 096 - Long Island Cache Pits; JUN 094 - Bear Shell Midden (NRHP - eligible); JUN 097 - Bevans Smokehouse/Cabin	Autrey 1978 Fields & Davidson 1979 Swanson 1988
205	Shoreline east and west of False Point and the peninsula south of this point - reconnaissance level	JUN 095 - Native Burial Site	Fields & Davidson 1979
206	Not examined.		
207	Shoreline of Icy Strait reconnaissance level (also private property survey)	None	Autrey 1978
208	South shore of Chatham Strait - reconnaissance level	None	Autrey 1978 Fields & Davidson 1979
209	Shoreline of VCU - reconnaissance level; selected cutting units - complete level	JUN 088 - Whitestone Harbor Petroglyph	Autrey 1978 Fields & Davidson 1979 Swanson 1988
210	Almost all of the VCU shorelines, reconnaissance level False Bay LTF site and road system from southern end of False Bay to VCU boundary - complete level	JUN 219 - Whitestone Burial	Autrey 1978 Fields & Davidson 1979 Swanson 1986 Swanson 1988

(Continued)

Table 3-28 (Continued)

**Previous Cultural Resource Surveys**

VCU	Previous Surveys	Recorded Sites	Reference <sup>1</sup>
211	Small part of southern shoreline	JUN 086 - Al-Ki Wreck (reported)	Autrey 1978 Fields & Davidson 1979
212	West shoreline of Chatham Strait - reconnaissance level. Road system from unit's northern boundary to Gypsum Creek - complete level	SIT 016 - Gypsum Mining Camp, SIT 235 - Gypsum Camel Claim	Autrey 1978 Fields & Davidson 1979 Swanson-Iwamoto 1988
213	North half of Iyoukeen Cove and part of Freshwater Bay shorelines - reconnaissance level	None	Autrey 1978 Fields & Davidson 1979
214	Entire shoreline of Freshwater Bay - reconnaissance level; mouth of Seal Creek, west and west side of Seal Creek - complete level	None	Fields & Davidson 1979 Swanson 1986 Swanson-Iwamoto 1988
215	Most of the Freshwater Bay shoreline - reconnaissance level; selected cutting units - complete level	SIT 092 and 093 Petroglyphs	Clark 1975 Autrey 1978 Fields & Davidson 1979 Autrey & Bjoertvedt 1984 Swanson 1986, 1988 Swanson-Iwamoto 1988
216	None	None	None
217	Kennel Creek LTF and portions of Freshwater Bay including Cedar Cove - reconnaissance level; one selected cutting unit - complete level	SIT 087 - Native garden site	Clark 1975 Autrey 1978 Swanson 1986, 1988

(Continued)

### 3 Affected Environment

Table 3-28 (Continued)

#### Previous Cultural Resource Surveys

VCU	Previous Surveys	Recorded Sites	Reference <sup>1</sup>
218	Most of the shoreline including Pavlov Lake, a strip of land between Pavlov Harbor and Wachusett Cove - reconnaissance level; selected cutting units - complete level	SIT 088, 090a, 090b - Native garden sites; SIT 089 - Native Smokehouse remains; SIT 164 - Freshwater Bay Village; SIT 288 - Native site	Clark 1975 Autrey 1978 Autrey & Bjotvedt 1984 Swanson 1986, 1988
219	Small segments of shoreline - reconnaissance level	SIT 091 - Native garden site; SIT Pictograph	Clark 1975 Swanson 1986
220	Shoreline between Columbia Point and Grave Island	SIT 167 and 181 - Native burial sites; SIT 084 - Tenakee Springs townsite	Ackerman 1974
221	None	None	None
222	None	None	None
223	None	None	None

<sup>1</sup>References on file at Chatham Area Supervisor's Office, Sitka, AK

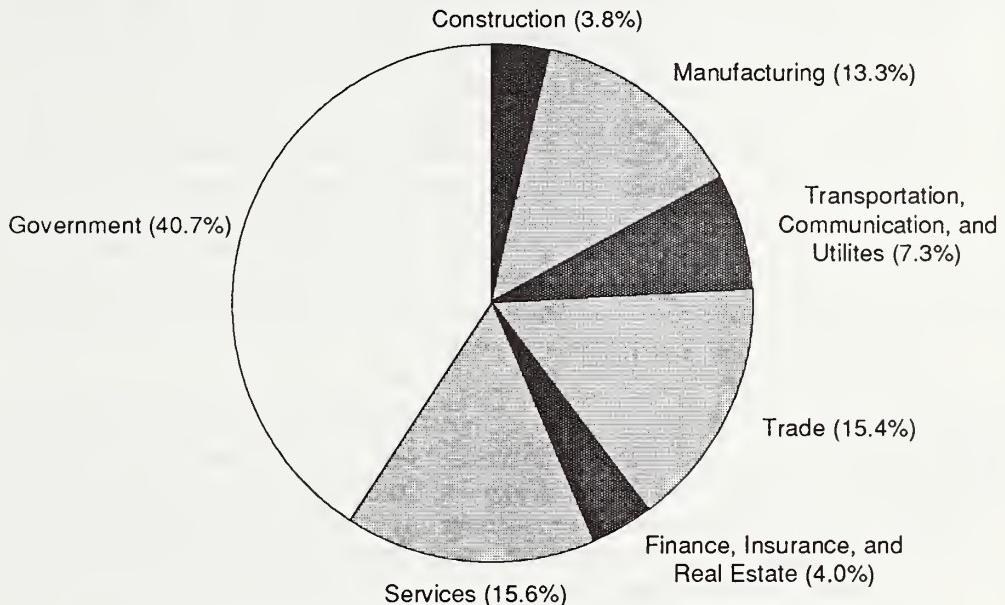


*Commercial Fishing is Very Important to Southeast Alaska's Economy*

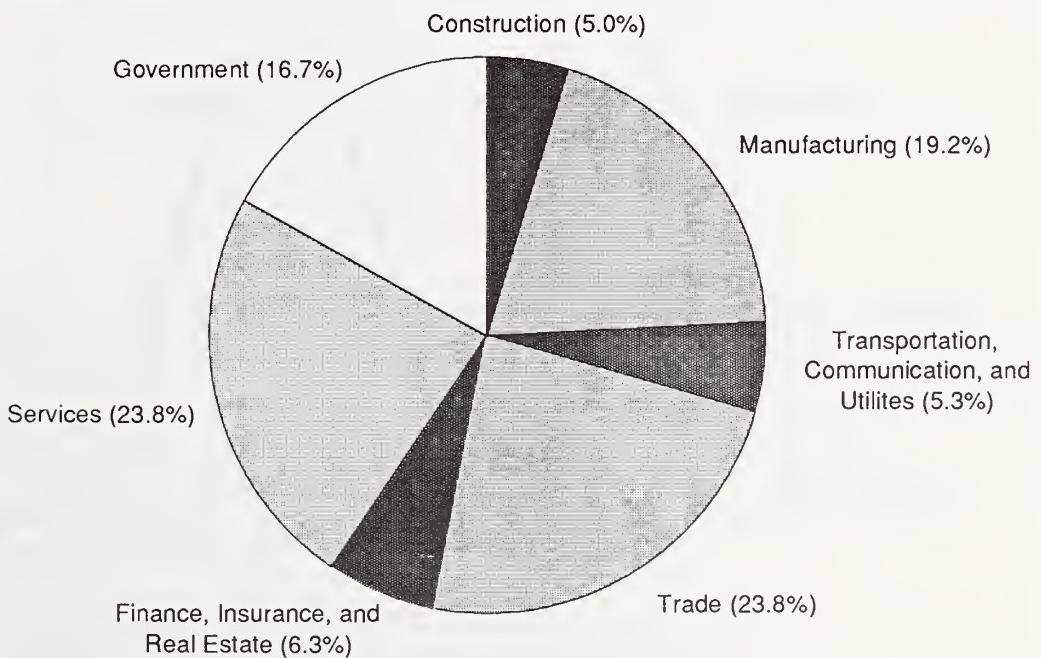
Figure 3-5

### Employment in Southeast Alaska Compared to Total US Employment

**Southeast Alaska**



**United States**



SOURCE: 1986 employment data from Alaska Department of Labor, Research Analysis Section. 1987. Statistical Quarterly, Fourth Quarter, 1986. Computations by EIS staff.

### 3 Affected Environment

#### Employment

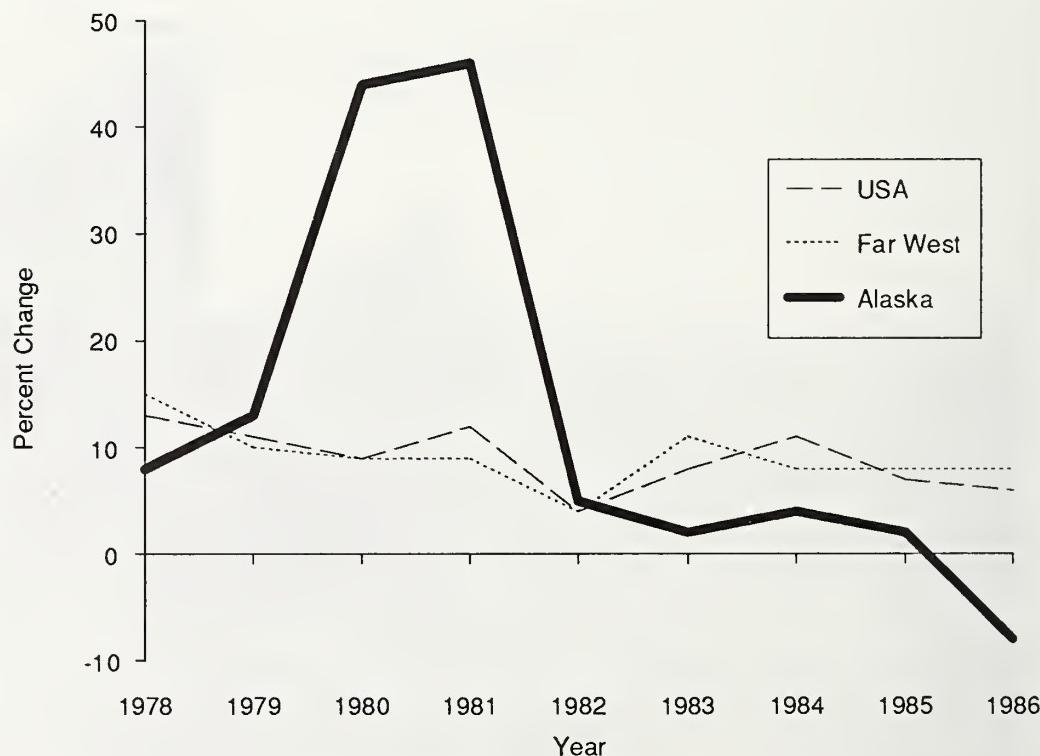
With its historical basis on natural resources, Alaska's economy has experienced the mixed blessing of high wages based on labor shortage along with high levels of unemployment in rural communities (Figure 3-9). In an effort to bolster economic development by expanding infrastructure, the state of Alaska launched numerous construction projects as oil revenues swelled in the late 1970s and early 1980s. The expansive state spending fueled growth in jobs, population, and incomes in Alaska from 1980 through 1985; during those five years, the number of wage and salary jobs in the state grew 35 percent, population 30 percent, and total personal income 70 percent (Goldsmith 1987). By contrast, the US population grew 5 percent, wage and salary employment increased 8 percent, and personal income only 47 percent.

Contraction in the state's oil revenues and the high rate of exchange between the US dollar and the Japanese yen resulted in a statewide recession between 1985 and 1987. In 1987, Alaska ranked number one among the states in the percentage of unemployed who were unemployed because they lost their jobs: 57.1 percent of the total employed (ranked first in the country), 70.4 percent of male unemployed (1st), and 37.8 percent of female unemployed (12th). In 1987, Alaska ranked seventh in the percentage of workers who were unemployed for a period of 15 weeks or more (33.4 percent). Particularly hard hit were the construction, transportation, and manufacturing sectors.

#### Economic Uses of the Forest

Timber harvest directly impacts several economic sectors including heavy construction, lumber and pulp products, and water transportation (Table 3-30). Employment in the commercial fishing sector is shown separately (Figure 3-10). The average annual value (exvessel value) of salmon produced in Analysis Area 3 has been estimated at \$320,000 (Figure 3-11). The production of pink and chum salmon contributes 88 percent of this value and coho production

Figure 3-6  
Change in Gross State Product for Alaska and USA, 1978-1986



SOURCE: Survey of Current Business, Vol. 68, No. 5, May 1988, US Department of Commerce, Bureau of Economic Analysis.

contributes 10 percent. Streams in VCs 204, 220, and 215 are most important, contributing over 73 percent of the total value, while VCs 209, 210, 217, and 218 contribute almost 20 percent. Sport fishing as well as sport and subsistence hunting affect sales, earnings, and employment in the retail trade and service sectors.

### Timber Harvest

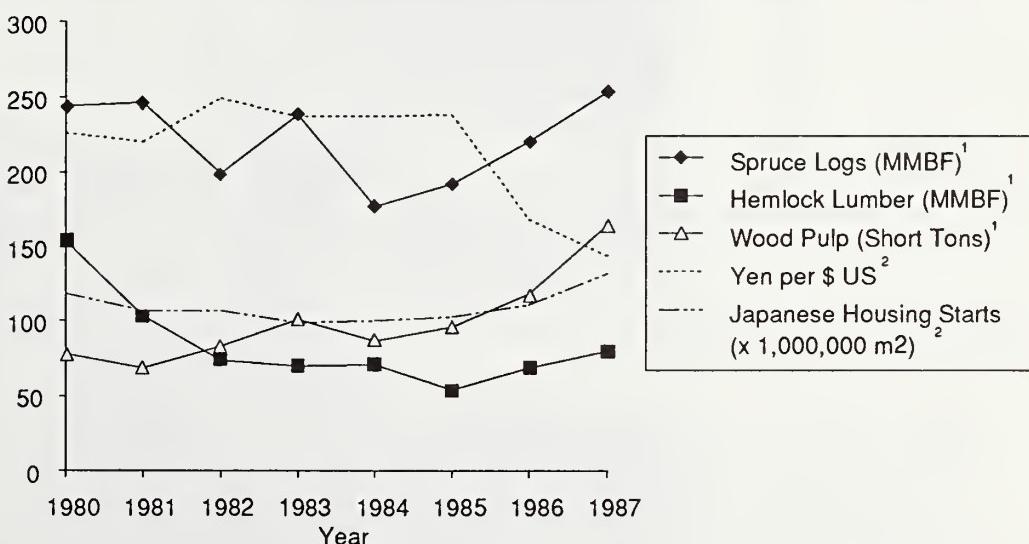
Figure 3-12 shows how employment depends on resource utilization and visitor accommodation in Southeast Alaska. These figures include employment supported by business expenditures in the resource industries (indirect) and the personal consumption expenditures of employees in the resource industries (induced). In total, direct employment in forest products, fishing, and visitor accommodation accounts for approximately 30 percent of the total wage and salary employment in Southeast Alaska. Alaska Pulp Corporation (APC), situated in Sitka, is the only user of the pulp logs harvested through the proposed action. Of the pulp shipped during 1986 by APC, 75 percent went to Japan. APC also exported pulp to Korea, Taiwan, China, Mexico, and Indonesia during 1986. Total value of APC exports in 1986 was \$50 million, 20 percent of the total value of forest product exports from Alaska, and 4 percent of the total value of all Alaskan exports. APC's 1987 pulp production increased 19 percent over 1986 levels, while the value of sales increased even more to \$80.5 million. In 1987, sales went to Japan (56 percent), Korea, Taiwan, Mexico, Egypt, Russia, Greece, Thailand, Hong Kong, and domestic markets (McDowell Group 1988).

During 1986, Alaska Pulp Corporation employed 391 workers in Sitka including 373 in pulp production and mill administration plus 18 longshoremen. The 373 mill workers accounted for 19.7 percent of Sitka's basic industry employment. When mill longshore labor is included, the pulp mill is responsible for 20.5 percent of basic industry employment in Sitka. The bonded indebtedness of Sitka and its rating are tied to the existence of the long-term contract.

Payroll statistics reveal an even greater impact in Sitka's economy. APC's 1986 millworker payroll of \$13.7 million is 27.6 percent of Sitka's basic industry payroll. Adding longshoremen

Figure 3-7

### Selected Alaskan Exports of Forest Products, 1980-1987

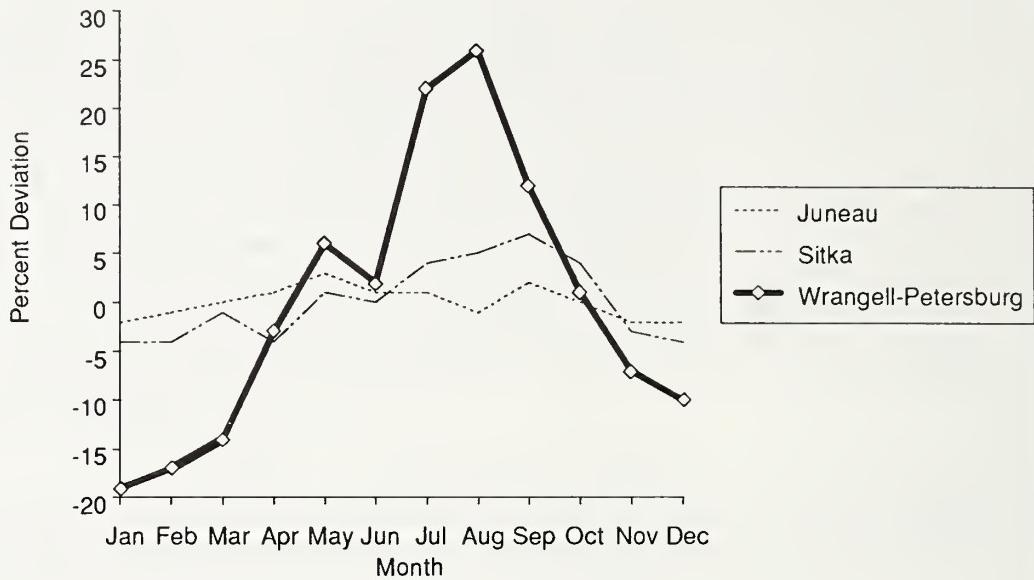


<sup>1</sup> Data obtained from US Department of Commerce database, Washington, D.C.

<sup>2</sup> Data obtained from Pacific Log Market Reports, published by J. Greenfield, A.C.F. and Associates, Seattle, WA.

### 3 Affected Environment

Figure 3-8  
Seasonality of Selected Southeast Alaska Employment, 1987



SOURCE: Alaska Department of Labor, Research and Analysis Section. 1987. Statistical Quarterly, Fourth Quarter.



Logging Provides Local Employment in the Hoonah Area.

Table 3-29

**Population Change in Southeast Region in 1980 and 1986**

Location	Provisional Census July 1, 1986	Official Census April 1, 1980	Change	Average Annual Percent Growth
State of Alaska	547,600	401,851	145,749	6
Southeast Region	64,437	53,794	10,643	3
Haines Borough	1,881	1,680	201	2
Juneau Borough	26,422	19,528	6,894	6
Ketchikan Gateway Borough	12,436	11,316	1,120	2
Prince of Wales/Outer Ketchikan Census Area	5,023	3,822	1,201	5
Sitka Borough	8,102	7,803	299	1
Skagway-Yakutat-Anoon Census Area	3,784	3,478	306	2
Angoon Census Subarea	781	712	69	2
Angoon City	605	465	140	5
Tenakee Springs City	125	138	-13	-2
Balance of Subarea	51	109	-58	-9
Hoonah-Yakutat Subarea	2,078	1,817	261	2
Elfin Cove	46	28	18	11
Gustavus	211	98	113	19
Hoonah City	895	680	215	5
Pelican City	270	180	90	8
Wrangell-Petersburg Census Area	6,789	6,167	622	2
Petersburg Subarea	4,248	3,804	444	2
Kake City	665	555	110	3
Petersburg City	3,182	2,821	361	3
Port Alexander City	128	86	42	8
Wrangell Subarea	2,402	2,184	178	1

SOURCE: Alaska Department of Labor, Research and Analysis Section, Demographic Unit, October 15, 1988.

payroll (an estimated \$720,000), APC accounts for 28.6 percent of Sitka's total basic industry payroll and 17.5 percent of all Sitka area payroll. The average annual salary of APC workers is nearly 50 percent higher than the Sitka area average.

From employment data it is possible to estimate population impacts. Based on the employment/population ratio, APC directly accounts for an estimated 820 Sitka residents, 10 percent of the total Sitka area population. This estimate gives equal weight to all Sitka area basic industries in determining population impacts. It is likely that the APC impact is somewhat greater, in relative and actual terms, than certain other basic industries in Sitka which may have a higher transient component or higher percentage of single men. APC's workforce has historically been a stable, year round and well paid workforce, more so than any other Sitka private basic industry.

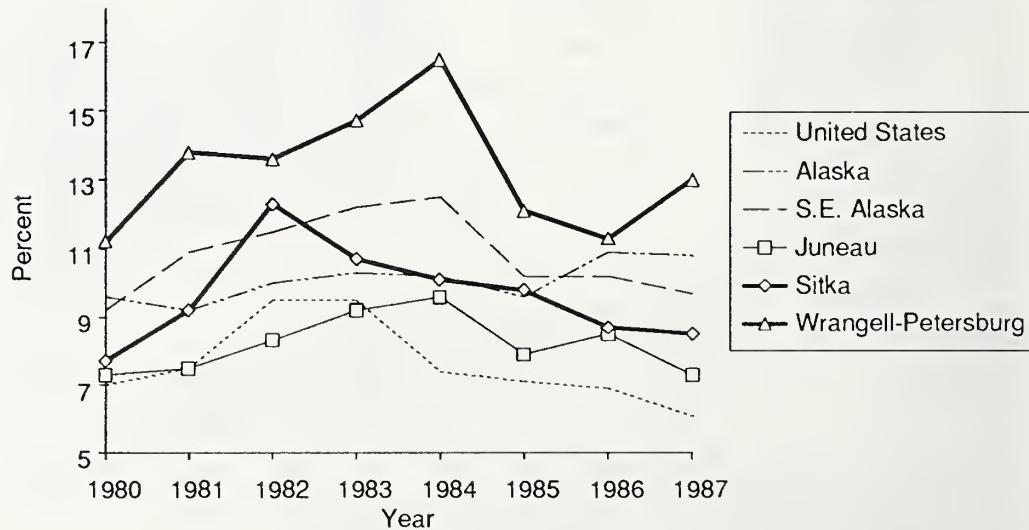
### 3 Affected Environment

The overall forest products industry employment impact of the APC Long-Term Sale includes pulp mill employment (373 jobs), direct logging employment (220 jobs), indirect logging employment (100 jobs), and indirect sawmill employment (150 jobs). This totaled 843 jobs in 1986, 35 percent of all forest products industry employment in Southeast Alaska. In terms of payroll, APC accounts for an estimated 35 percent, or \$30 million, of the total forest products industry payroll, estimated at \$84 million in 1986.

The sawmill employment occurs at the sawmill in Wrangell, which is owned by APC and operated by Wrangell Forest Products. An estimated 70 percent of Wrangell sawmill production is attributable to APC sawlog volume. The APC pulp plant is also a market for Wrangell sawmill chip production. This sawmill is the largest economic contributor to the Wrangell community, being directly or indirectly responsible for one-quarter of all employment in the Wrangell area. Several other communities, including Hoonah and Tenakee, experience employment and income benefits as a result of APC operations in the Analysis Area.

From 1980 through 1987, timber-harvest and forest products manufacture supported an average of 4,481 jobs in Southeast Alaska (Figure 3-13). During this period approximately 60 percent of the timber harvested in Southeast Alaska came from land administered by the Forest Service (Figure 3-14). All softwood log exports (except cedar) originated on private or state lands as a result of federal requirements for primary processing for timber from federal land. Given the volumes reported on harvest (Figure 3-14) and export (Figures 3-15a and 15b) of softwood log products, most of the sawlog volume harvested from private land has been exported. Assuming that low-grade logs on private lands are sold as pulp logs and are harvested in about the same proportion as the utility harvest reported on the Tongass National Forest (12.4 percent), har-

Figure 3-9  
Unemployment Rates, 1980-1987



SOURCE: US-Economic Report to the President, February 1988, Table B-39, p. 292, Government Printing Office, Washington, D.C.

Alaska - 1980-1984 data: Alaska Planning Information, Alaska Department of Labor, Research and Analysis Section, February 1986, pp. 24-25.

1985-1987 data: Alaska Economic Trends, March 1988, p. 19, Alaska Department of Labor, Research and Analysis Section.

SE Alaska & Census Areas - 1980-1984 data: Alaska Economic Trends, April 1986, p. 32.

1985-1986 data: Alaska Economic Trends, March 1987, pp. 10-11.

vests from the Tongass National Forest support 60 percent of the logging employment, all of the sawmilling employment, and about 75 percent of the pulp mill employment in the region. The actual level varies from year to year based on harvest by ownership and the comparative strength of the export market. In the 1980s, forest products provided 12 percent of the region's wage and salary employment with the timber from the Tongass supporting about 7 percent of the jobs.

The harvest of APC long-term sale volume in Analysis Area 3 averaged 30.2 million board feet (utility and sawlog volume) from 1986 to 1988. Harvest, road construction, processing of the pulp logs in Sitka, and the sawlogs in Wrangell supported 56 jobs in Southeast Alaska.

Table 3-30

**Southeast Alaska Employment from 1981 to 1987<sup>1</sup>**

Industry	1981	1982	1983	1984	1985	1986	1987
Nonagricultural Wage & Salary	26,995	27,705	28,483	28,661	29,190	29,035	28,600
Construction	1,404	1,514	2,017	1,814	1,665	1,098	1,100
Building Construction	395	420	548	528	497	329	
Heavy Construction	627	655	820	531	491	334	
Special Trades	382	440	649	755	677	436	
Manufacturing	3,884	2,861	3,355	3,008	3,236	3,854	4,100
Food & Kindred Products <sup>2</sup>	1,125	1,092	908	871	996	1,160	1,100
Lumber & Paper Products <sup>3</sup>	2,576	2,589	2,255	1,946	2,039	2,491	2,800
Other Manufacturing	183	180	192	191	201	203	200
Transportation, Comm. & Utilities	2,506	2,238	2,025	1,950	2,032	2,107	2,100
Water Transportation	542	447	486	452	470	464	
Air Transportation	760	634	492	469	469	526	
Trade	3,847	4,167	4,406	4,576	4,552	4,465	4,500
Wholesale	300	334	438	384	370	335	400
Retail	3,547	3,834	3,968	4,193	4,183	4,130	4,100
Food Stores	704	797	842	838	845	836	
Eat & Drink	1,152	1,245	1,247	1,243	1,342	1,405	
Other Retail Trade	1,691	1,792	1,879	2,112	1,996	1,889	
Finance, Insurance, & Real Estate	1,088	957	992	1,037	1,105	1,164	1,100
Mining, Services & Miscellaneous	3,409	3,850	4,297	4,521	4,488	4,520	4,600
Hotel, Motel	527	592	730	775	801	721	
Medical Services	613	674	744	775	782	862	
Other	2,269	2,584	2,823	2,971	2,905	2,932	
Government	10,857	11,119	11,390	11,754	12,113	11,826	11,000
Federal	2,345	2,216	2,163	2,087	2,085	2,084	1,900
State	5,001	5,313	5,407	5,476	5,520	5,394	5,000
Local	3,512	3,591	3,820	4,191	4,508	4,348	4,100

SOURCE: Alaska Department of Labor, Research and Analysis Section, 1988. Report of Employment and Wages, ES-202.

<sup>1</sup> For nonagricultural wage and salary employment only. These numbers represent a "job count" and do not distinguish between full and part-time employment. The employment figures do not include self-employed persons, unpaid family help, domestics, most persons engaged in commercial fish harvesting and agriculture, and military employment.

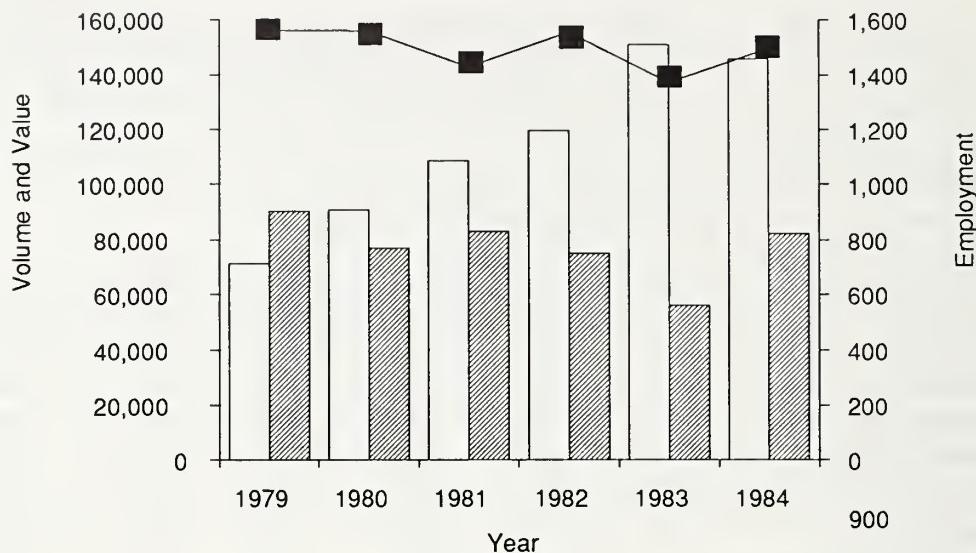
<sup>2</sup> Seafood processing.

<sup>3</sup> Includes logging, sawmill and pulpmill related employment.

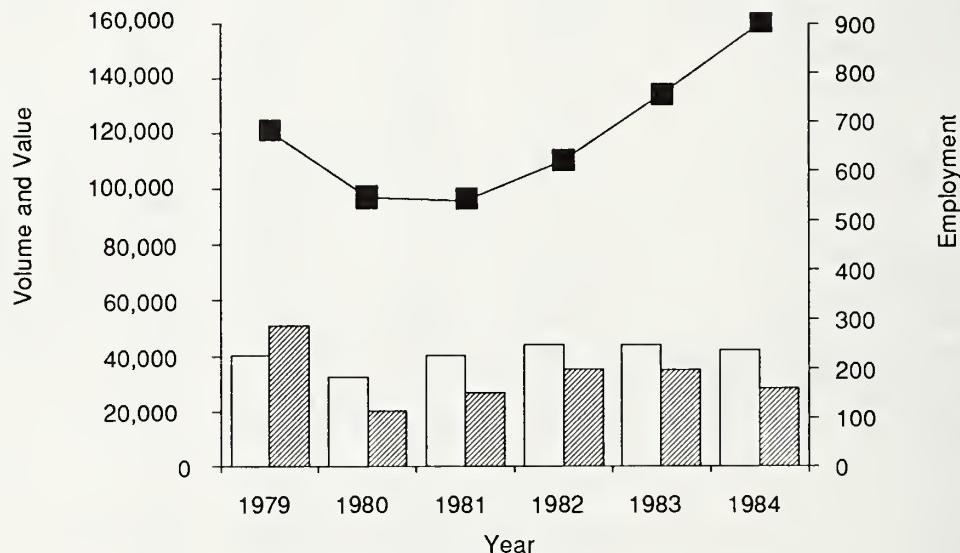
### 3 Affected Environment

Figure 3-10  
Fishery Employment in Southeast Alaska, 1979-1984

#### Salmon Fishery



#### Other Fisheries

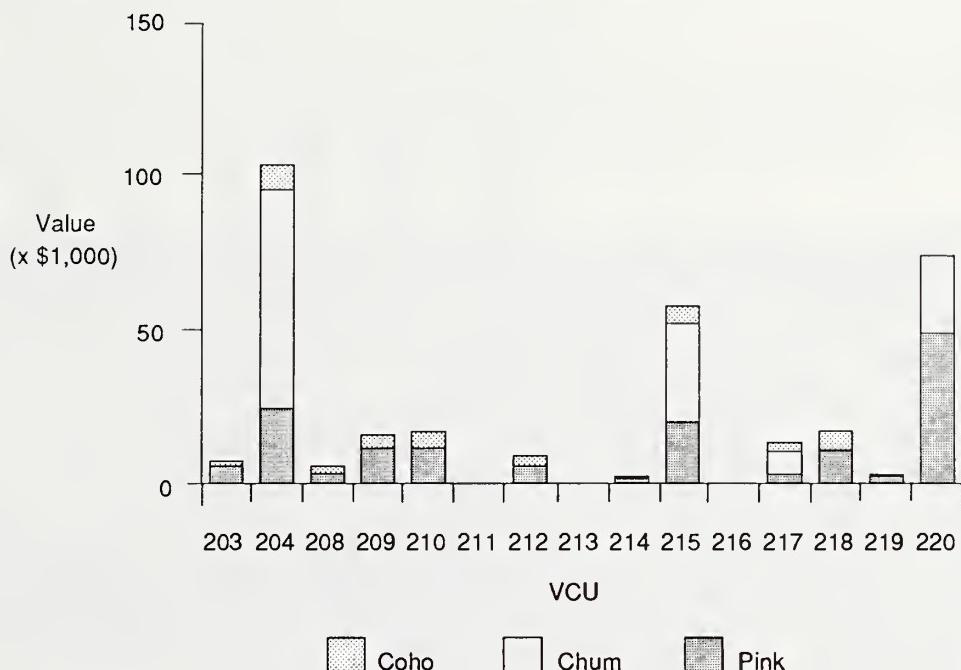


- Volume ( X 1,000 lbs )
- ▨ Ex-Vessel Value ( X \$1,000 )
- Employment

SOURCE: Thomas, K. 1987. Alaska Seafood Industry Employment 1977-1984. Alaska Department of Labor, Research and Analysis Section. pp. 11-29.

Figure 3-11

### Estimated Average Annual Value of Salmon Produced in Analysis Area 3



SOURCE: Based on data from Holstine and Collizi (1984).

#### Commercial Fishing

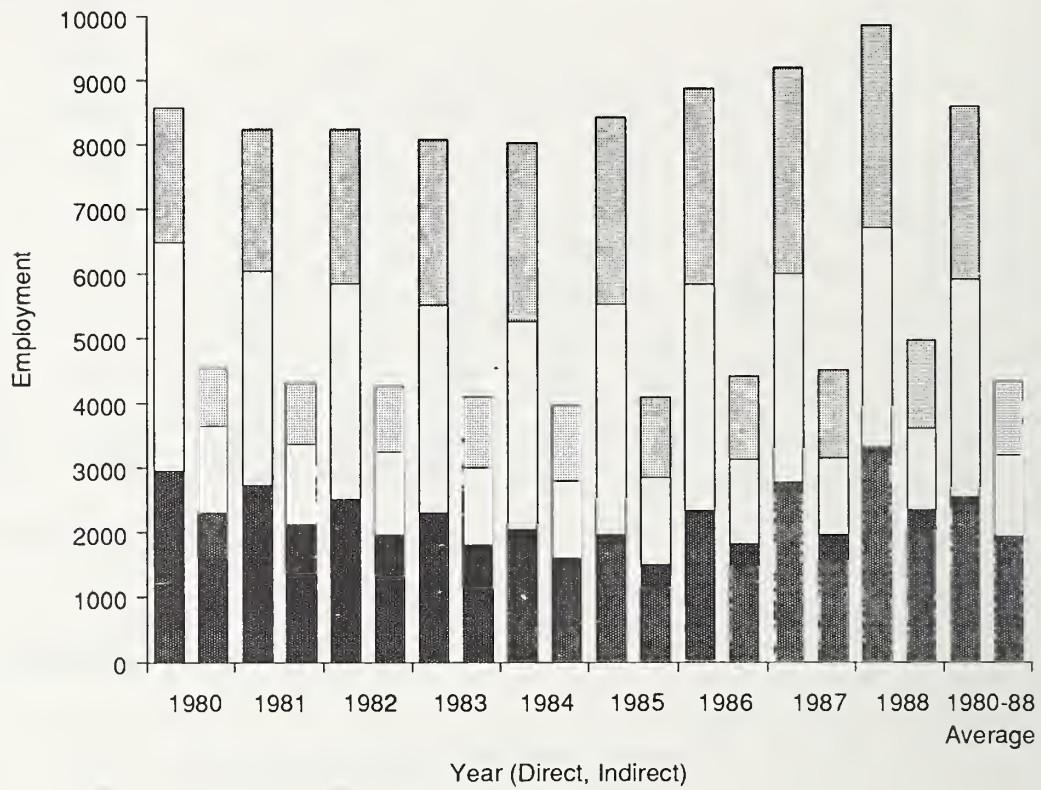
The comparative volumes and value reported in Figure 3-10 suggest that from one-half to two-thirds of the fish used by the fish processing industry are salmon. Assuming that employment in the industry is proportional to some combination of the values and volumes of fish processed, then from one-half to two-thirds of the industry's employment is dependent on salmon. National Forest habitats produce salmon harvested in Southeast Alaska's fisheries. If habitat is proportional to ownership of timberland in Southeast Alaska then the Tongass National Forest would contribute up to 80 percent of the salmon harvest. This result assumes that hatchery-reared stock in the harvest is minor and the combined catch of hatchery stocks, wild stocks originating outside Southeast Alaska, and wild stocks reared on private or state lands total approximately 20 percent of the total harvest.

Anadromous fish rearing habitat on the National Forest lands in Southeast Alaska likely supports just under 1,750 jobs (or 55 percent of employment) in the commercial fishing/fish processing sectors. About 330 more employees in the retail, service, supply, and construction sectors depend on the business purchases and personal consumption expenditures of the fishermen and fish processors. With total wage and salary employment in the region averaging about 28,000 between 1980 and 1987, approximately 7 percent of the region's population depends on the harvest of salmon spawned on the National Forest in Southeast Alaska. Individual communities may have a higher degree of dependence. In addition, for some families, commercial fishing and processing work provide an income supplement rather than their principal source of earnings. For other families, income from fishing or cannery work is the only cash supplement to an otherwise subsistence lifestyle. The Tongass Resource Use Cooperative Survey (Kruse and Frazier 1988) reports the results of a survey in which sampled households were asked to

### 3 Affected Environment

Figure 3-12

#### Direct and Indirect Employment in Forest Products, Fishing, Fish Processing, Tourism and Resident Recreation, 1980-1988<sup>1</sup>



- Tourism and Resident Recreation
- Fishing and Fish Processing
- Forest Products

SOURCE: Status of the Tongass National Forest, 1987 Report, ANILCA 706(b), Report No. 2. USDA Forest Service, Alaska Region, MB 35, March 1988. Chapter 2, Pg. 20.

<sup>1</sup> Data are for Southeast Alaska.

indicate economic activity by type of industry. The percentage of households by community that participate in commercial fishing and fish processing is shown in Figure 3-16.

Habitat on lands administered by the Forest Service in Analysis Area 3 produce an average commercial harvest of 289,000 pounds of pink salmon, 178,000 pounds of chum salmon, and 30,000 pounds of coho salmon. Commercial harvest by the fleet based in Southeast Alaska supports an annual average of ten jobs spread across the harvesting, processing, and support sectors.

### Tourism and Recreation

Visitor accommodation and recreational expenditures by residents of Southeast Alaska supported about 3,010 jobs during the 1980s. The purchases made by Southeast Alaska businesses and the personal consumption of their employees supported another 770 employees. Together, tourism and recreational expenditures maintained approximately 13 percent of wage and salary employment in the region.

An estimated 285 jobs in Southeast Alaska depend on the expenditures made by hunters. About 820 jobs in the region result from the purchases of sport anglers. Another 290 jobs result from the purchases of businesses and their employees. In total, hunting and fishing related expenditures produce approximately 5 percent of the region's wage and salary employment.

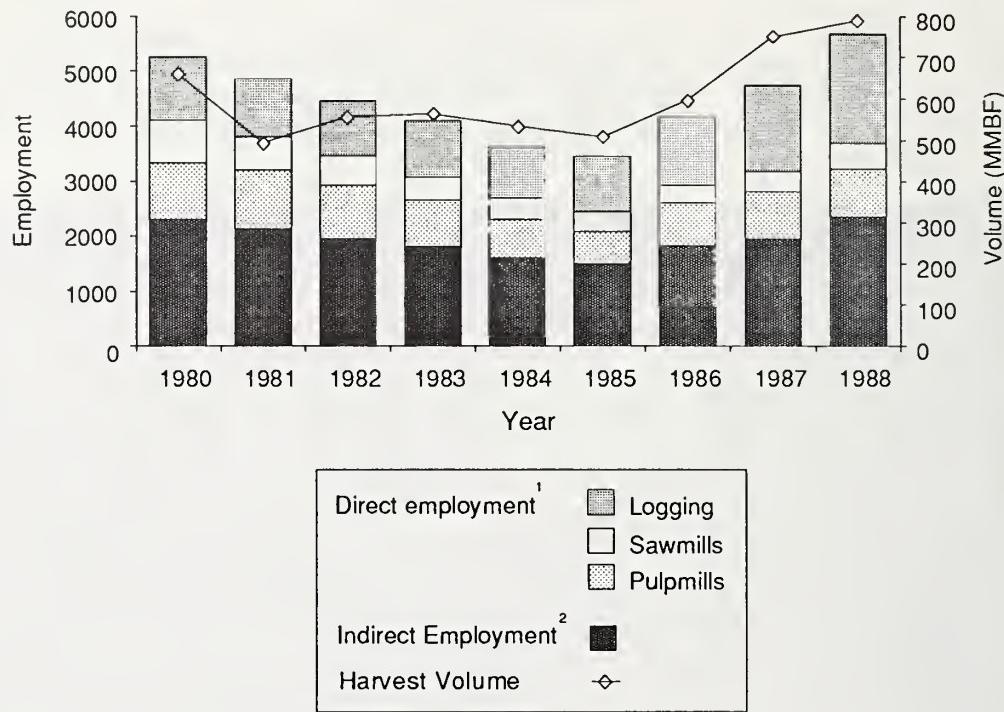


*Processing Salmon at Local Cold Storages Aids the Cash Economy.*

### 3 Affected Environment

Figure 3-13

#### Lumber and Wood Products Industry Employment in Southeast Alaska, 1980-1988



SOURCE: Timber Supply and Demand Draft 1988 Report. ANILCA 706(a) Report No. 8. USDA Forest Service, Alaska Region, R10-MB-55.

<sup>1</sup> Alaska Department of Labor statistics subject to revision. Current as of February 9, 1989.

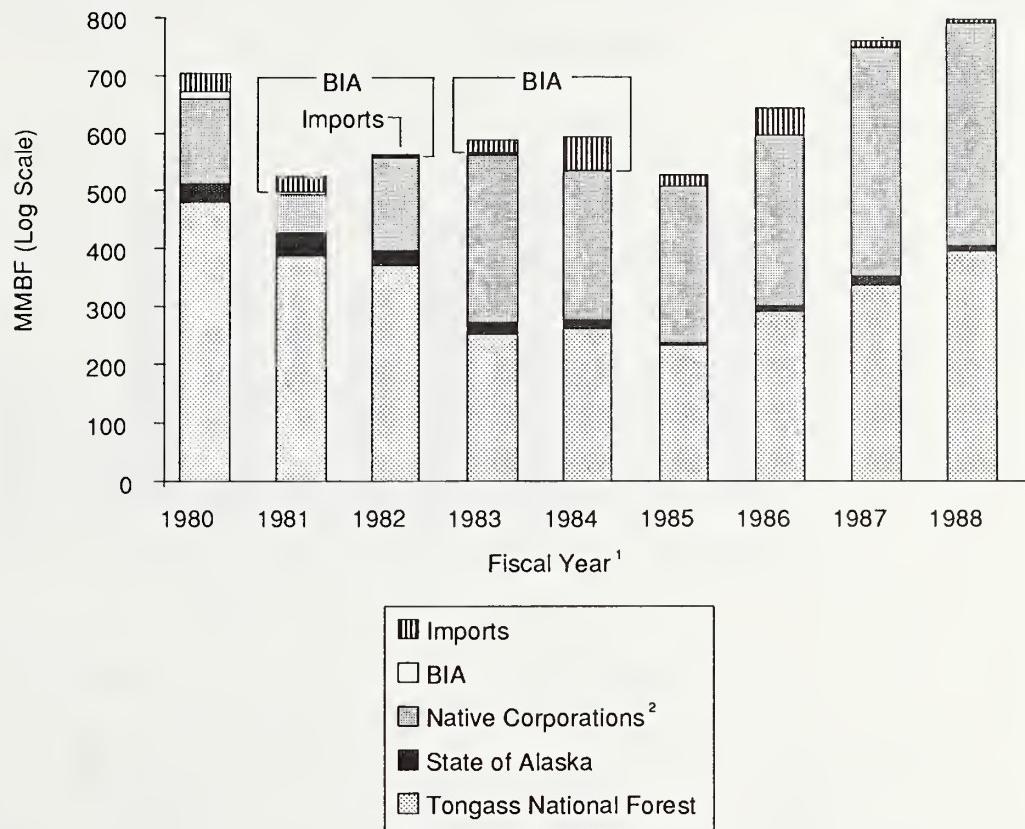
<sup>2</sup> Rounded to the nearest 25 jobs.



Tourists Also Contribute to the Local Economy.

Figure 3-14

### Source of Timber Processed in Southeast Alaska



SOURCE: Timber Supply and Demand Draft 1988 Report, ANILCA 706(a) Report No. 8. USDA Forest Service, Alaska Region, R10-MB-55.

NOTE: BIA stands for the Bureau of Indian Affairs.

<sup>1</sup> The Federal Fiscal year extends from October 1st to September 30th of the following year.

<sup>2</sup> Estimate. Sources were not found for certain years or ownerships and are not estimated. Some of the private harvest reported in fiscal years 1982-86 for southeast Alaska originated from southcentral Alaska, but data were not available to separate the two regions from the estimated total.

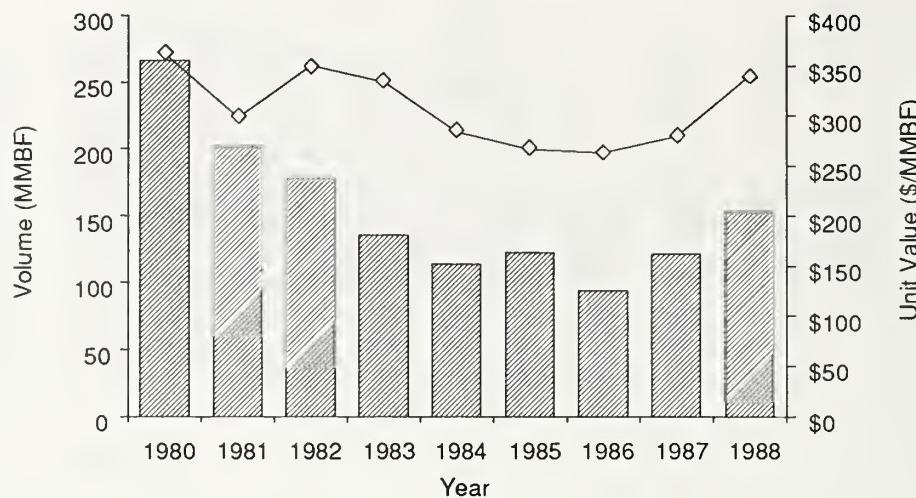
Five outfitter or guide service permit holders who use Analysis Area 3 were briefly interviewed to determine what areas within Analysis Area 3 they use, and how much they use them. Outfitters provide bear and deer hunting, photographing, hiking, dispersed camping, scenic viewing, study of flora and fauna, and forest experience. The main areas they use are the Game Creek, the head of Freshwater Bay, Seal Creek, Whitestone Harbor, and Pavlof Harbor.

The average number of people being taken into this area is about 56 per year, with the average trip lasting eight to nine days. The permit holders average five trips per season.

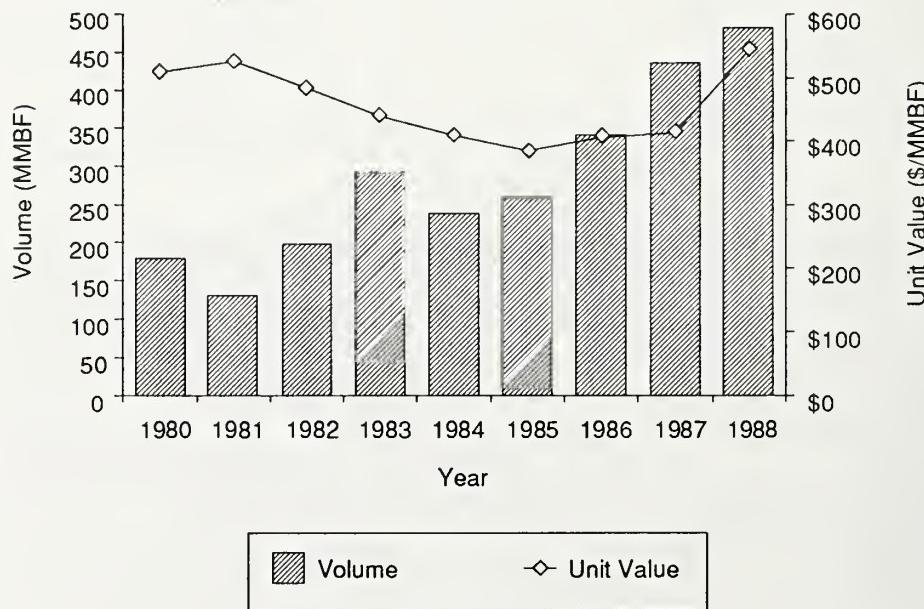
Hunter effort in the Analysis Areas forms the basis for some of the expenditures that support jobs and personal earnings in Southeast Alaska. Figure 3-17 presents hunter-days for the region while Table 3-31 summarizes information on deer hunting, and Figure 3-18 on fishing. In 1987, the 8,181 hunter-days for deer recorded in Analysis Area 3 supported 30.4 jobs spread over the retail trade, services, and transportation sectors.

Figure 3-15a  
Forest Product Exports from Alaska to All Destinations

#### Lumber and Cants



#### Softwood Log



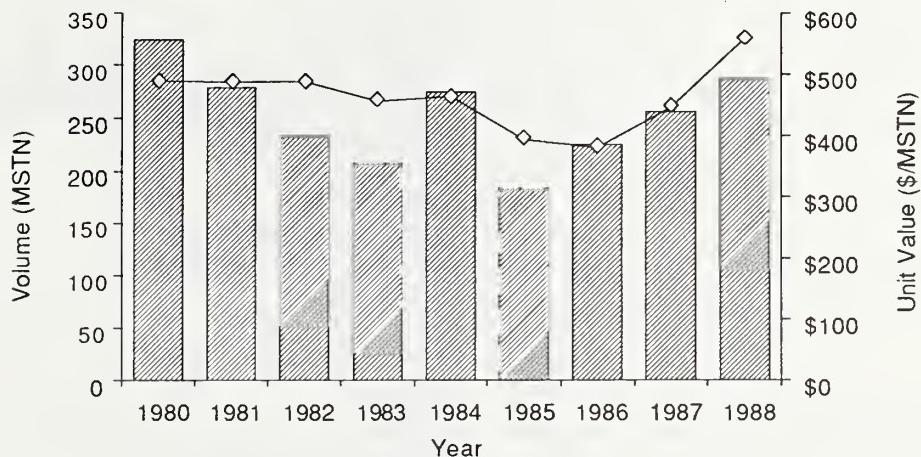
SOURCE: Timber Supply and Demand Report, 1987, ANILCA 706(a) Report No. 7. USDA Forest Service, Alaska Region, May 1988, Pg. 15.

NOTE: Volumes exported are in millions of board feet (MMBF) or thousands of short tons (MSTN). Values are free alongship (FAS) in thousands of nominal dollars. Unit values are dollars per unit.

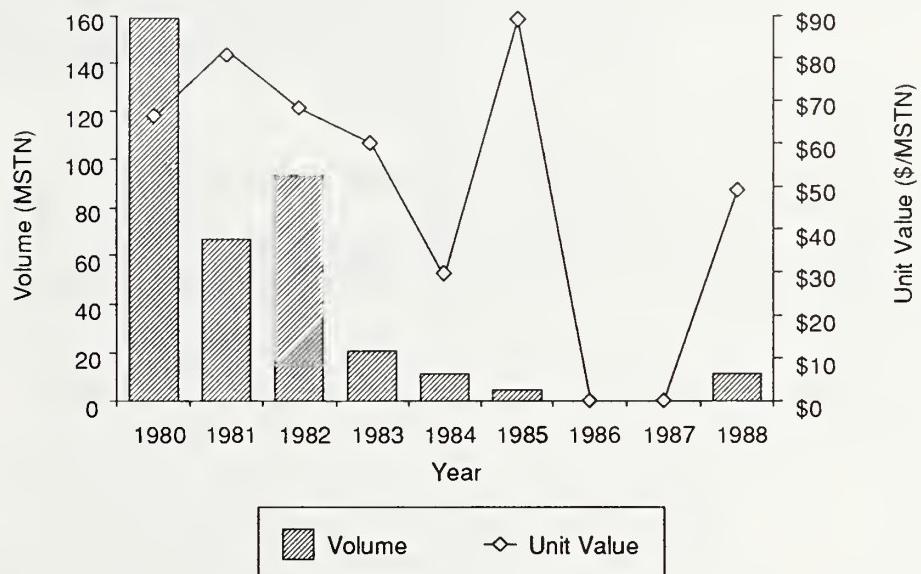
Figure 3-15b

### Forest Product Exports from Alaska to All Destinations

#### Woodpulp



#### Woodchips



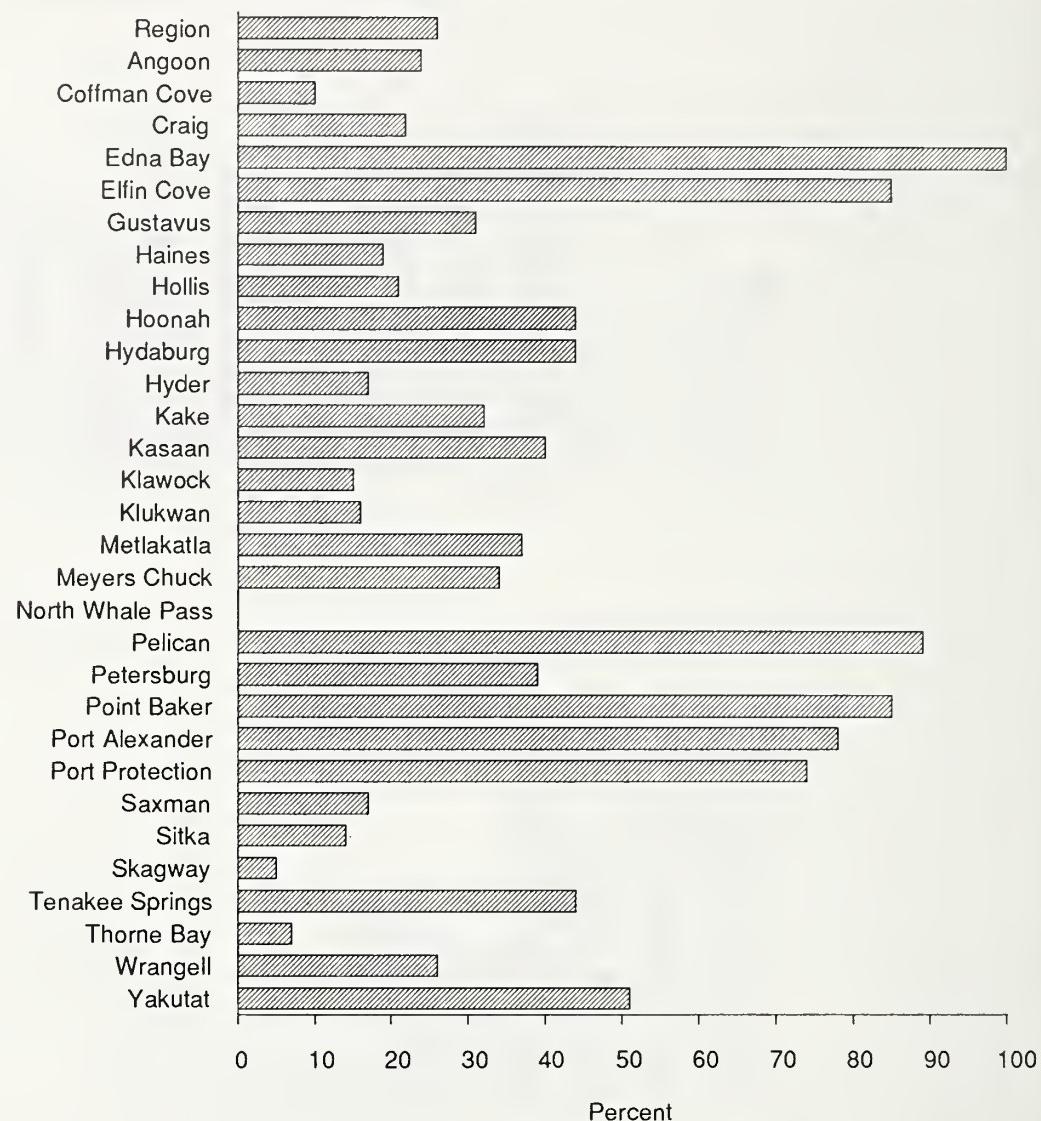
SOURCE: Timber Supply and Demand Report, 1987, ANILCA 706(a) Report No. 7. USDA Forest Service, Alaska Region, May 1988, Pg. 15.

NOTE: Volumes exported are in millions of board feet (MMBF) or thousands of short tons (MSTN). Values are free alongship (FAS) in thousands of nominal dollars. Unit values are dollars per unit.

### 3 Affected Environment

Figure 3-16

#### Household Participation in Commercial Fishing and Fish Processing by Community<sup>1</sup>



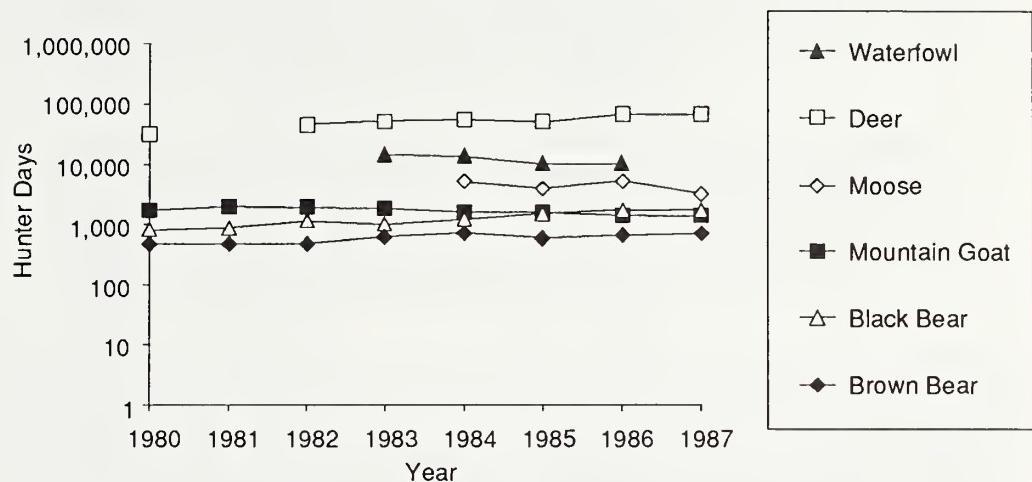
SOURCE: Krusc, J. and R. Frazier. 1988. Community Reports, Tongass Resource Use Cooperative Survey. Institute of Social and Economic Research, University of Alaska, Anchorage.

NOTE: While some families live exclusively on earnings from commercial fishing, participation in commercial fishery does not exclude other forms of employment or sources of income. This results from the fact that some families have several people in the labor force and some workers hold two or more jobs often in different sectors.

<sup>1</sup> The percent of sampled families indicating they were active in a commercial fishery in 1987.

Figure 3-17

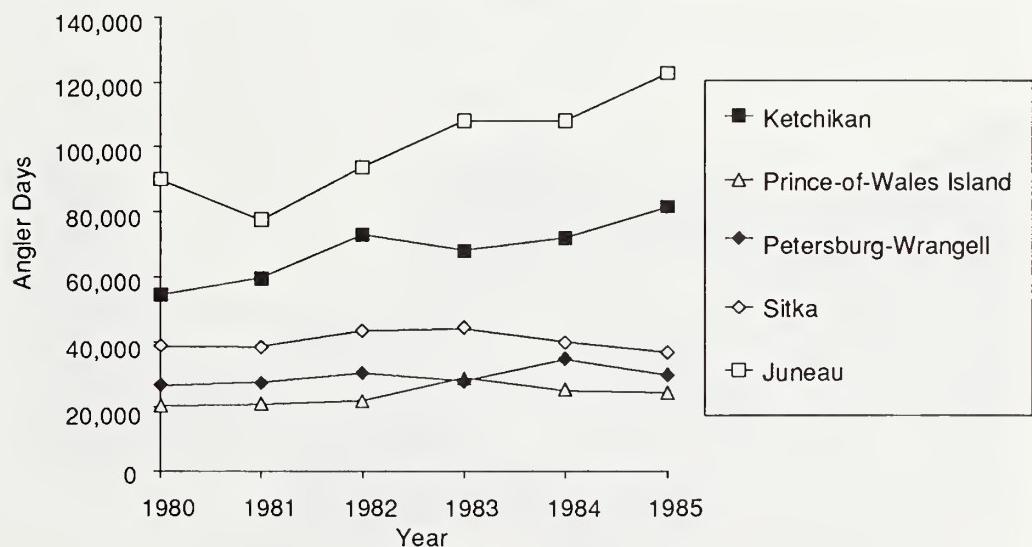
### Number of Hunter Days in Southeast Region



SOURCE: Fay, G. and M. Thomas. 1986. Deer Hunter Economic Expenditures and Use Survey, Southeast Alaska. ADF&G Habitat Technical Report 86-10. 1987 data from personal communication with ADF&G.

Figure 3-18

### Angler Days in Southeast Alaska, 1980-1985



SOURCE: Mills, M.J., Statewide Harvest Study, Vol. 27, Federal Aid in Fish Restoration and Anadromous Fish Studies, Alaska Department of Fish & Game, Table 7, Pg. 15.

### 3 Affected Environment

Table 3-31  
Deer Hunting by Community in 1985

Community	Active Hunters (percent)	Hunter Days	Hunting Expenditures (dollars)
Angoon	21	521	44,991
Craig	28	1,504	172,340
Elfin Cove	90	194	22,847
Gustavus	6	128	1,624
Haines	6	1,963	39,821
Hoonah	33	1,229	114,925
Hydaburg	15	147	26,359
Juneau	11	13,906	1,634,555
Kake	22	407	40,293
Ketchikan	13	12,476	803,816
Klawock	33	1,443	57,091
Metlakatla	4	160	8,970
Meyers Chuck	23	100	3,781
Pelican	29	293	30,049
Petersburg	14	2,633	192,748
Point Baker	18	73	4,361
Port Alexander	12	64	2,290
Skagway	1	16	96
Sitka	22	8,834	945,915
Tenakee Springs	28	358	9,891
Wrangell	18	1,905	154,438
Yakutat	2	56	1,248
Other Prince of Wales	27	1,394	60,662
Other Alaska	— <sup>1</sup>	422	77,011
Outside Alaska	— <sup>1</sup>	352	98,886
Total for Southeast Region	14 <sup>2</sup>	50,578	4,549,008

SOURCE: Fay, G. and M. Thomas. 1986. Deer Hunter Economic Expenditures and Use Survey, Southeast Alaska. ADF&G Habitat Technical Report 86-10.

<sup>1</sup> Information not available.

<sup>2</sup> Percentage value is the average for the communities.

## Subsistence

The Forest Service's 1981-86 Record of Decision preceded the passage of the Alaska National Interest Lands Conservation Act (ANILCA). The Federal District Court, in *Tenakee Springs v. Courtright*, did not decide if the Forest Service complied with Section 810 of ANILCA. The Forest Service did comply with Section 810 by performing a subsistence evaluation in conjunction with the 1986-90 Operating Period EIS. This evaluation was challenged in the United States District Court for the Alaska District in *Hanlon v. Barton*. In a preliminary decision, the Federal District Court recognized the importance of the Section 810 evaluation of potential project effects on subsistence activities in an environmental analysis. In response to *Tenakee Springs v. Courtright* and *Hanlon v. Barton* and to ensure that the 1981-86 and 1986-90

Records of Decision fully comply with ANILCA, the Forest Service is providing site-specific subsistence evaluation in Phases I and II of the EIS Supplement.

Many Southeast Alaska communities depend on natural resources found in the APC Contract area for their livelihood. Activities such as fishing, hunting, tourism, timber harvest, and mining all depend on natural resources. With the passage of the Alaska National Interest Lands Conservation Act, Congress also recognized the importance of subsistence resources to the rural communities of Alaska. ANILCA defines subsistence as:

The customary and traditional uses by rural Alaska residents of wild, renewable resources for direct personal or family consumption as food, shelter, fuel, clothing, tools, or transportation; for the making and selling of handicraft articles out of non-edible byproducts of fish and wildlife resources taken for personal or family consumption; for barter, or sharing for personal and family consumption; and for customary trade (ANILCA, 16 USC 3113).

The sharing of subsistence products among community members is an important aspect of traditional subsistence use. Table 3-32 shows the pounds of subsistence resources harvested per capita as well as the number of different types of resources harvested. It also shows the number of different types of resources that are shared (received by a household). Low income households or households whose members are unable to participate in the harvest of subsistence resources may depend on receiving products from other members of the community. Therefore, the importance of subsistence to a community can be shown, not only in the amount harvested, but also in the amount of sharing that occurs among community members.

Mean income is another indicator of the importance of subsistence to a community. A household with a higher income would be able to supply more of its needs through the cash economy. However, it should be noted that a higher income does not always indicate a lesser



Historic Summer Hunting and Fishing Cabin at Freshwater Bay.

### 3 Affected Environment

Table 3-32

#### Role of Subsistence in Community Lifestyles

	Pounds Harvested Per Capita <sup>1</sup>	Resource Types Harvested <sup>2</sup>	Resource Types Received <sup>2</sup>	1987 Per Capita Income
Angoon	242	7.9	6.4	\$5,364
Elfin Cove	264	10.0	6.8	\$8,195
Gustavus	256	8.5	4.2	\$12,781
Haines	105	4.3	4.1	\$12,467
Hoonah	404	9.1	7.7	\$9,353
Kake	160	6.5	7.0	\$9,057
Klukwan	239	5.9	6.1	\$5,853
Pelican	355	10.0	9.0	\$11,317
Petersburg	203	7.4	5.1	\$12,602
Point Baker	345	9.4	5.3	\$6,212
Port Alexander	306	9.7	5.4	\$6,343
Port Protection	311	10.2	7.7	\$5,912
Sitka	139	5.7	0.0	\$14,572
Tenakee Springs	343	7.5	5.5	\$9,080
Wrangell	164	5.6	6.3	\$11,989
Region	176	6.2	3.7	\$11,921

SOURCE: Kruse, J. and R. Frazier, 1988. Community Reports, Tongass Resource Use Cooperative Study. Institute of Social and Economic Research, University of Alaska, Anchorage, in cooperation with ADF&G Division of Subsistence.

<sup>1</sup> Mean value is estimated from a sample of households in each community. Actual amounts harvested may be somewhat higher or lower.

<sup>2</sup> Average number of different resource types harvested or received by households surveyed.

dependence on subsistence resources. For example, people who earn high incomes may give the resources they harvest to others who are unable to harvest their own.

Even if a household can purchase all of its food needs through the cash economy, the act of gathering subsistence resources is an important cultural aspect in Southeast Alaska communities. For example, traditional foods may not be available through any means other than subsistence gathering. The occasions for gathering wild foods are often also social events. Historical patterns of movement, such as the annual cycle of dispersal into small family groups at summer fishing camps to larger gatherings at protected winter villages are also linked to the tradition of subsistence harvest.

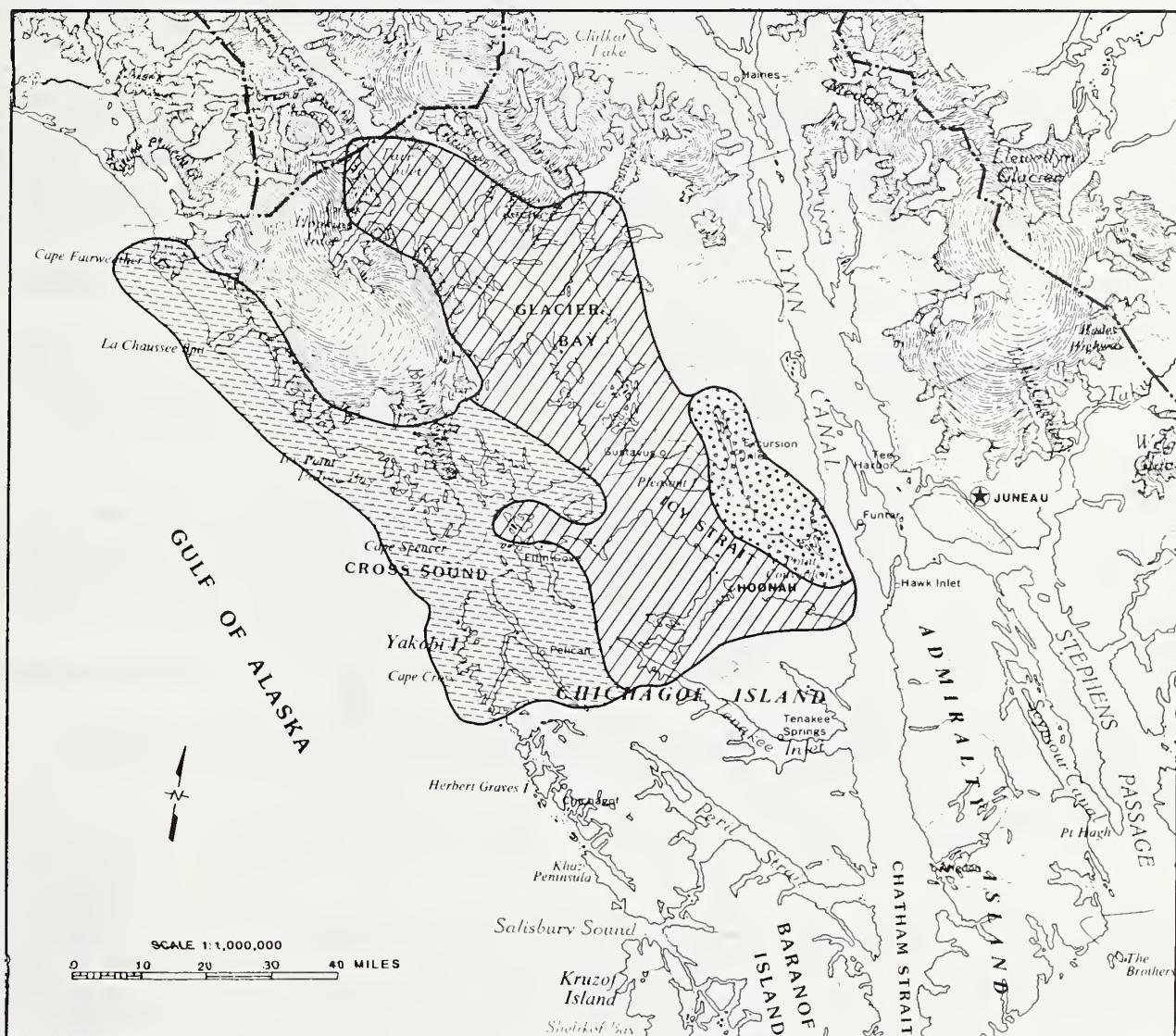
The communities that use Analysis Area 3 are Hoonah, Tenakee Springs, Gustavus, Wrangell, Angoon, Sitka, Haines, Petersburg, Kake, Klukwan, and Pelican. Information on the history, population, economy, and subsistence uses for these communities follows. The location of subsistence uses by VCU by community follows in the Use of Analysis Area VCUs section. Residents of logging camps at Long Island and Freshwater Bay may also qualify as subsistence users under current State of Alaska, Department of Fish and Game regulations.

#### Hoonah

Hoonah has been a principal winter camp for the Huna Tlingits of the Glacier Bay/Icy Straits Area for centuries. The town site is protected from winter storms and provides good access to subsistence resources. Historically, the community was populated by three Tlingit Clans: Chukanei Dee, T' Akdeintaan, and Woosh Ki Taan Clans (see Figure 3-19). Huna Tlingits ex-

Figure 3-19

Territories of Hoonah Tlingit Clans, 1946



TERRITORIES OF HOONAH  
TLINGIT CLANS, 1946



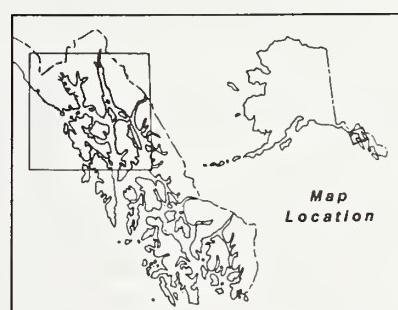
STATE OF ALASKA  
DEPT. OF FISH AND GAME  
Subsistence Division

CHUKANEI DEE

T'AKDEINTAAN

WOOSH KI TAAN

Source: Redrawn from Goldschmidt and Hees, 1946. Original data were based on field interviews with Tlingit elders in Hoonah, 1945 and review of historical documentation of clan territory.



### 3 Affected Environment

erted some control over the sea otter fur trade that moved through Chatham Strait and Lynn Canal.

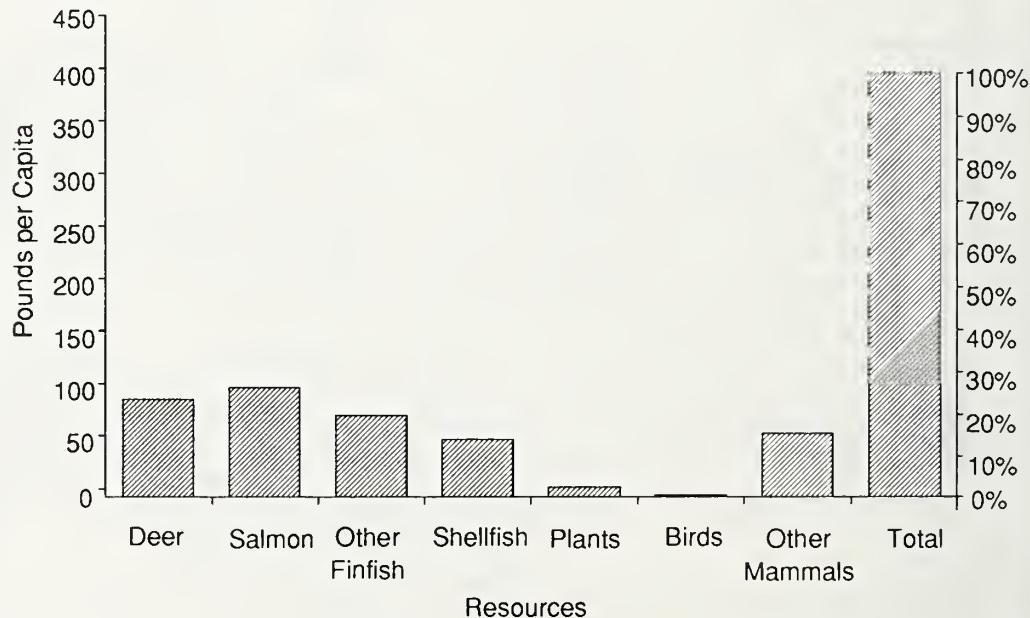
In 1880, a store was built in Hoonah and in the following year missionaries settled in the town, establishing the Presbyterian Home Mission church and school. Commercial fishing began with the development of salteries and canneries near Hoonah; in 1912 a cannery was built a mile north of the community; a cold storage facility still operates in Hoonah.

Today, fishing and fishing processing are the principal industries for Hoonah. In 1986, the population of Hoonah was 960, and 71 percent of the population was Alaska Native. In recent years, Hoonah has become the center of logging activities on northern Chichagof Island. Logging is taking place on National Forest lands as well as land owned by the Huna Totem and Sealaska Corporations. A religious farming community also has become established at Game Creek, just south of Hoonah. Major sources of employment by industry are: fish and fish processing, 50 percent; retail, 11 percent; school, 10 percent; government, 8 percent; logging, 8 percent; and transportation, 1 percent.

Employment is highly seasonal in all areas except government, with more than 40 percent unemployed during a 1985 survey. Although the average income was about \$13,000, more than 40 percent reported an income of less than \$5,000 (ADF&G 1989). The Draft Tongass Resource Use Cooperative Study (TRUCS) reported a mean per capita income of about \$9,350 in 1987 (Kruse and Frazier 1988).

Hoonah residents hunt deer, goats, seals, waterfowl and other birds; trap furbearers; catch salmon and other finfish; and gather shellfish, berries, and seaweed. The annual harvest of subsistence resources was about 400 pounds per capita in 1987, dominated by salmon (26 percent), deer (23 percent), and other finfish (19 percent) (Figure 3-20). Subsistence food provides about 50 percent of the household food supply.

Figure 3-20  
**1987 Harvest of Principal Subsistence Resources - Hoonah**



SOURCE: Kruse, J. and R. Frazier. 1988. Community Reports, Tongass Resource Use Cooperative Survey. Institute of Social and Economic Research, University of Alaska, Anchorage, in cooperation with ADF&G Division of Subsistence.

## Tenakee Springs

Tenakee Springs is located at hot springs on Tenakee Inlet in Chichagof Island, that were first known to Tlingit inhabitants of nearby villages. The word "Tenakee" comes from the Tlingit language and means either "twin cities" or "bay on the other side." The original winter village site was located in the vicinity of the present boat harbor, with a summer village site across the Inlet at Kadashan Bay. The Decitan Tlingit originally owned Tenakee Inlet, ceding the region to the Woosh Ki Taan to settle a murder. The Tlingit called the hot springs "Daay Axa" and Indian River "Klaa Gu Woo Aan Heen" (Leghorn and Kookesh 1987).

Tenakee was the site of a seasonal Tlingit village before being used in the late 1800s by prospectors who frequently wintered there. A permanent community eventually developed around the springs, offering such amenities as a store, post office, hot baths, and pool halls. Residents built cabins along a boardwalk and enclosed the springs in a concrete bath house.

A cannery was built near Tenakee in 1916, operating sporadically into the 1960s. Another nearby cannery opened in 1918 and closed in the late 1920s. A small crab cannery operated in the town until 1974. With the closing of the canneries, Tenakee Springs has become known as a retirement community for its core of older residents. More recently, however, a number of younger families have settled in Tenakee Springs, attracted by a rural lifestyle based on subsistence, gardening, and cottage industries. The population in 1984 was 156, with 5 percent Alaska Native.

Logging began at nearby Corner Bay in the early 1970s resulting in some growth for Tenakee Springs. Intermittent logging has also occurred in the Indian River drainage adjacent to town. The town supports a small commercial fishing fleet. Many houses in Tenakee Springs are used as retirement or vacation homes by residents of other Alaska communities bringing about 40 percent of the economy. Sources of employment by sector include retail, 36 percent; government, 25 percent; fishing and logging, 25 percent; and manufacturing, 14 percent. Employment is highly seasonal in all sectors other than government. The Tongass Resource Use Cooperative Study (TRUCS) reported a mean per capita income of just over \$9,000 in 1987.

In pursuing traditional subsistence resources, Tenakee Springs residents hunt deer, bear, and seals; catch salmon and other finfish; collect shellfish; and trap furbearers. The annual harvest of subsistence resources was about 340 pounds per capita in 1987, dominated by deer (39 percent), other finfish (24 percent), shellfish (17 percent), and salmon (14 percent) (Figure 3-21). Subsistence provides just over 40 percent of the household food supply.

## Gustavus

Gustavus is located across Icy Strait from Point Adolphus, near the entrance to Glacier Bay. The whole of Glacier Bay historically belonged to the Tlingits where they had important winter villages and summer fishing and seal hunting camps. They were able to obtain virtually every item in their economy from the Glacier Bay area. Tlingit history recounts how the people were forced to leave their permanent settlements in the area by advancing glaciers. The area remains an important subsistence use area for the Tlingits who established new villages at places like Hoonah and who have settled in newer communities such as Gustavus and Elfin Cove.

At the turn of the century, agricultural homesteaders settled in the Gustavus area. The flat land and sandy soils remaining when the glaciers retreated made good agricultural land. Until the 1950s, homesteaders supplied meat and produce to Juneau.

World War II brought FAA communication facilities and an airstrip. Glacier Bay National Park was established in 1937, but access via Gustavus was not established until the 1960s.

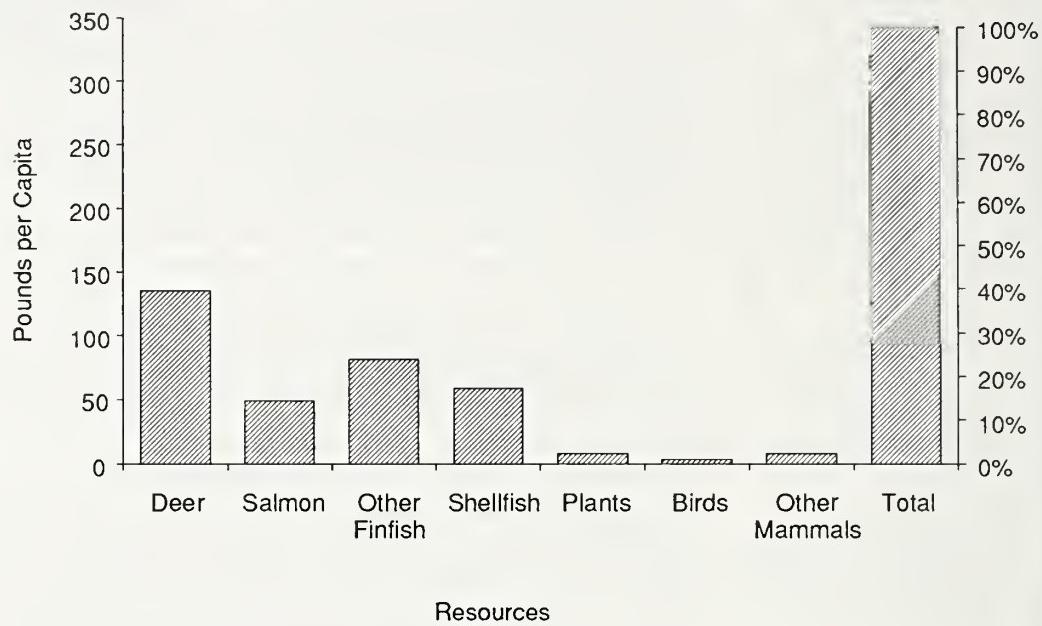
Presently, Gustavus is a fishing and agricultural community with a growing tourism industry. The main access point for Glacier Bay National Park and surrounding points of interest is through Gustavus. The population increases during summer months in response to seasonal work.

The population of Gustavus was estimated to be 154 in 1988 with 5 percent Alaska Native. Major sources of employment by industry include: educational services, 35 percent; govern-

### 3 Affected Environment

Figure 3-21

#### 1987 Harvest of Principal Subsistence Resources - Tenakee Springs



SOURCE: Kruse, J. and R. Frazier. 1988. Community Reports, Tongass Resource Use Cooperative Survey, Institute of Social and Economic Research, University of Alaska, Anchorage, in cooperation with ADF&G Division of Subsistence.



ment, 25 percent; manufacturing, 13 percent; services, 11 percent; fishing, 7 percent; and transportation, 7 percent. All sectors are highly seasonal. The average income was about \$16,500 (ADF&G 1989).

In pursuing traditional subsistence resources, residents of Gustavus hunt deer, bear and waterfowl, catch salmon, other fish and crabs, and gather clams and berries. The annual harvest of subsistence resources was about 256 pounds per capita in 1987. This annual harvest was dominated by finfish other than salmon (32 percent), deer (25 percent), and salmon (21 percent) (Figure 3-22). Almost 50 percent of the household food supply is provided by subsistence.

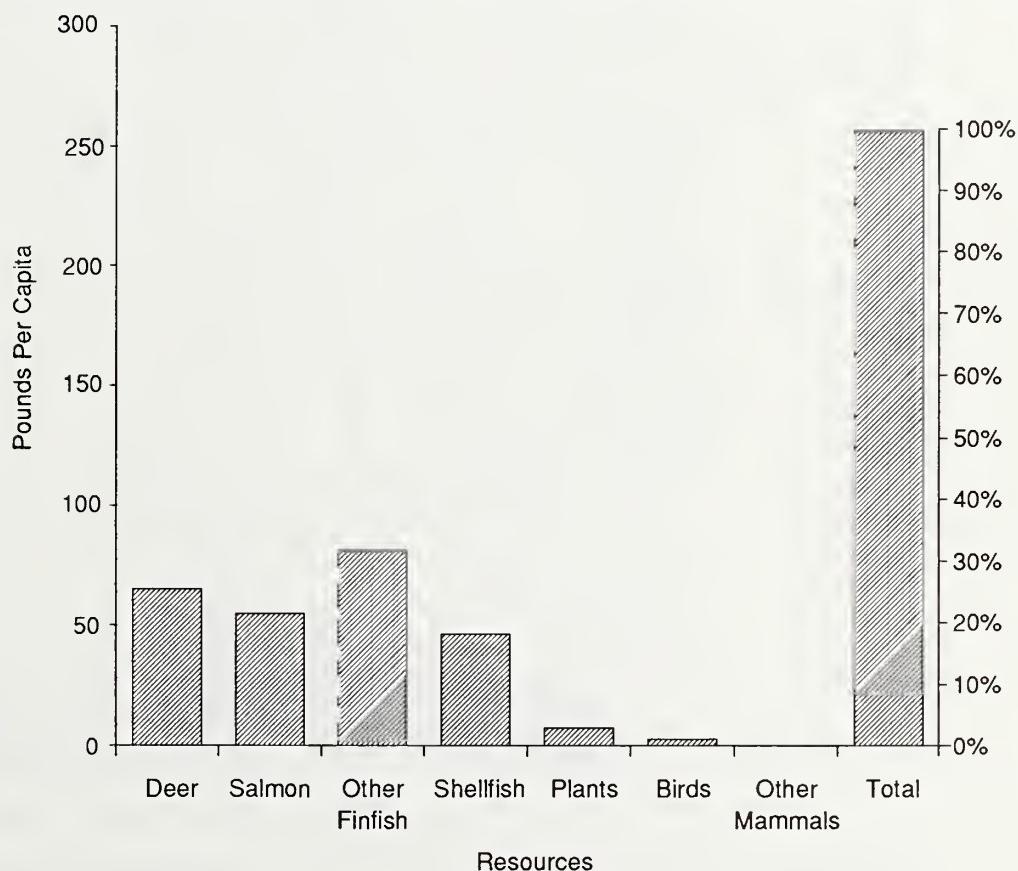
## Wrangell

Wrangell, located in the east-central portion of southeast Alaska, is on the northern tip of Wrangell Island, about seven miles from the mouth of the Stikine River. The Stikine is one of only a few major rivers that cut through the massive coastal mountains providing access into Canada. Historically, it has been an important trade route. Tlingit people from a major village 13 miles from the present site of Wrangell used the Stikine to trade with the Athapaskans in the Interior.

Russian traders and Canadians were also interested in the Wrangell area. The Russians were first to build a fort, but then leased the land to the Hudson Bay Company. Under a British flag, Wrangell became a major trading center in the area.

Figure 3-22

### 1987 Harvest of Principal Subsistence Resources - Gustavus



SOURCE: Kruse, J. and R. Frazier. 1988. Community Reports, Tongass Resource Use Cooperative Survey. Institute of Social and Economic Research, University of Alaska, Anchorage, in cooperation with ADF&G Division of Subsistence.

### 3 Affected Environment

Wrangell was a jumping-off point for three successive gold rushes. The boom and bust cycles of the mining affected its growth and economy. By the time the third strike had run its course, though, two canneries and a sawmill were established. Today it is an active fishing and timber-processing town.

The 1985 population of 2,836 was almost 40 percent Alaska Native. The major sources of employment include: government, 25 percent; retail trade, 19 percent; manufacturing, 16 percent; fishing and fish processing, 13 percent. Employment in the tourism, retail, and fishing sectors is seasonal.

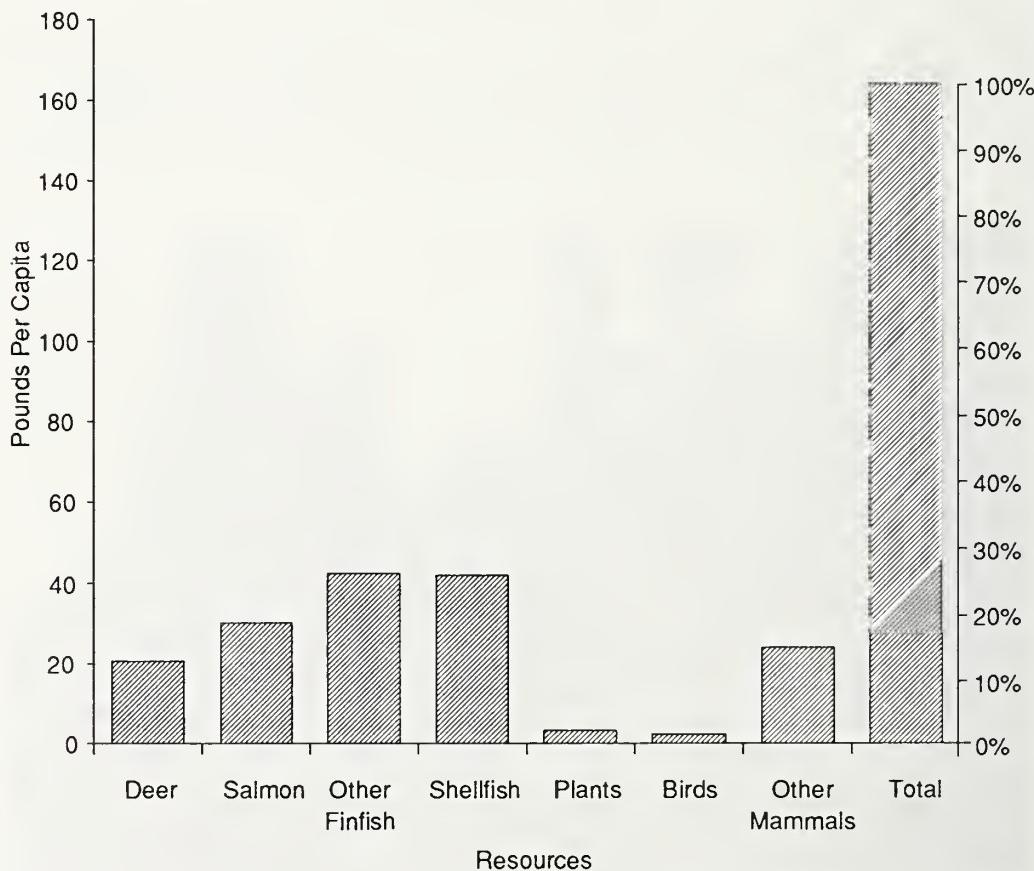
Wrangell residents hunt deer, moose, bear and waterfowl, fish for salmon, halibut, and other marine fish, and gather shellfish and berries. The annual harvest of subsistence resources was about 165 pounds per capita in 1987, dominated by shellfish (25 percent), salmon (18 percent), and other finfish (26 percent). (Figure 3-23). Subsistence resources provide about 23 percent of the household food supply.

#### Angoon

Tlingit history holds that three Deisheetaan hunters discovered the site of Angoon. Already living in the area, the Gaanax'adi people left after a while when trouble developed between the two groups. Historically, several Tlingit clans have occupied the area around Angoon (Figure 3-24). Angoon is so old that no exact date has been established for the beginning of its occupa-

Figure 3-23

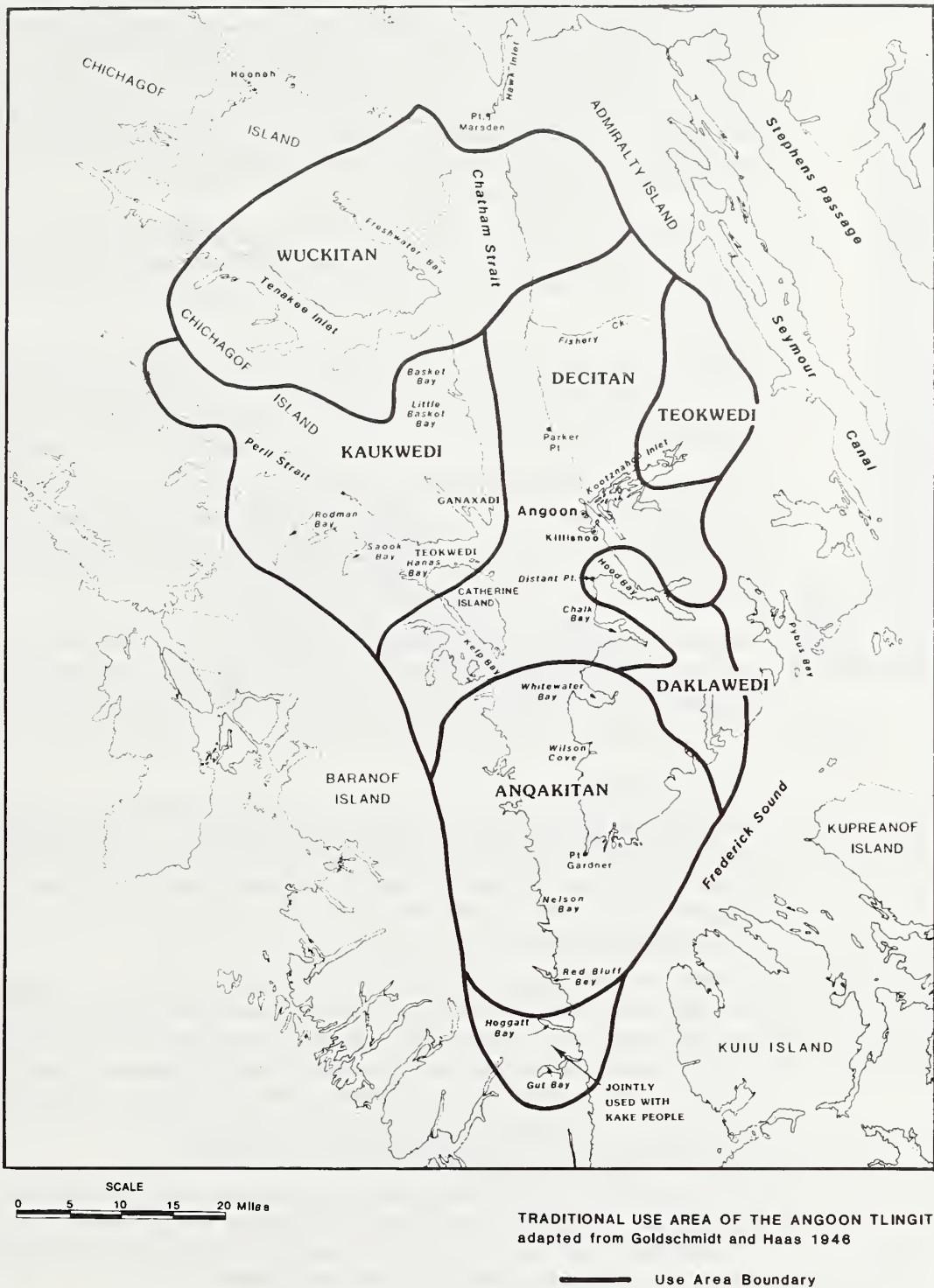
#### 1987 Harvest of Principal Subsistence Resources - Wrangell



SOURCE: Kruse, J. and R. Frazier. 1988. Community Reports, Tongass Resource Use Cooperative Survey. Institute of Social and Economic Research, University of Alaska, Anchorage, in cooperation with ADF&G Division of Subsistence.

Figure 3-24

Traditional Use Area of the Angoon Tlingit



STATE OF ALASKA DEPT. OF FISH AND GAME  
Subsistence Division

See: "Timber Management and Fish and Wildlife Utilization in Selected Southeast Alaska Communities: Angoon, Alaska," Technical paper 159, for further information.

SOURCE: ADF&G Subsistence Division.

### 3 Affected Environment

tion. The first documented contact with European explorers came in 1794 when Vancouver saw people trading furs at Angoon, suggesting that fur trapping and trading with the Russians from Sitka had been important to the Angoon Tlingit for some time (George and Bosworth 1987).

Smallpox epidemics of the early 1800s decimated many Tlingit villages, and the survivors settled in the village of Angoon, increasing its population. In 1880, the Northwest Trading Company established a whaling station and trading post on nearby Killisnoo Island that employed some Angoon residents. After a few years, the whaling station was converted to a herring processing plant and ceased operations in the late 1800s. Angoon residents have been employed at various salmon canneries along Chatham Strait, including Sitkoh Bay, and other locations (George and Bosworth 1988).

Although Angoon incorporated as a city in 1963, the contemporary village holds its clan structure largely intact and keeps Tlingit traditions alive. The community has a large proportion of life-long residents who value close family time, good housing, and hunting and fishing opportunities.

Angoon had a population of 630 in 1985, with 78 percent Alaska Native (George and Bosworth 1988). Employment is generally limited. Recreation and tourism opportunities have been improving since 1980 when the Admiralty Island National Monument was established. Some residents have jobs logging on land owned by the village or regional Native corporations.

Sources of employment include schools, 33 percent; government, 25 percent; fishing, 10 percent; and construction, 7 percent. Employment is highly seasonal in all sectors, and most of the male workforce worked for fewer than half of the weeks in 1979. The Tongass Resource Use Cooperative Study (TRUCS) reported a mean per capita income in 1987 of \$5364, less than half that of the region as a whole (Kruse and Frazier 1988).

Angoon residents harvest deer, salmon, other fish, waterfowl, and shellfish among other resources. The annual harvest of subsistence resources was about 250 pounds per capita in 1987, dominated by deer (30 percent), salmon (29 percent), other finfish (14 percent), and other mammals (14 percent) (Figure 3-25). Subsistence provides 46 percent of the household food supply.

#### Sitka

Tlingit Indians have lived in the Sitka area for centuries, using its abundant natural resources. These resources also attracted the traders of many nationalities, and by 1799 Sitka was a favored trading location. In that year, Alexander Baranof, manager of the Russian-American Company, bargained with the local Tlingit chief of the Ki Ksadi clan for land to build the headquarters of his fur trading business. Baranof built a fort near the present site of Sitka and named it Saint Archangel Michael.

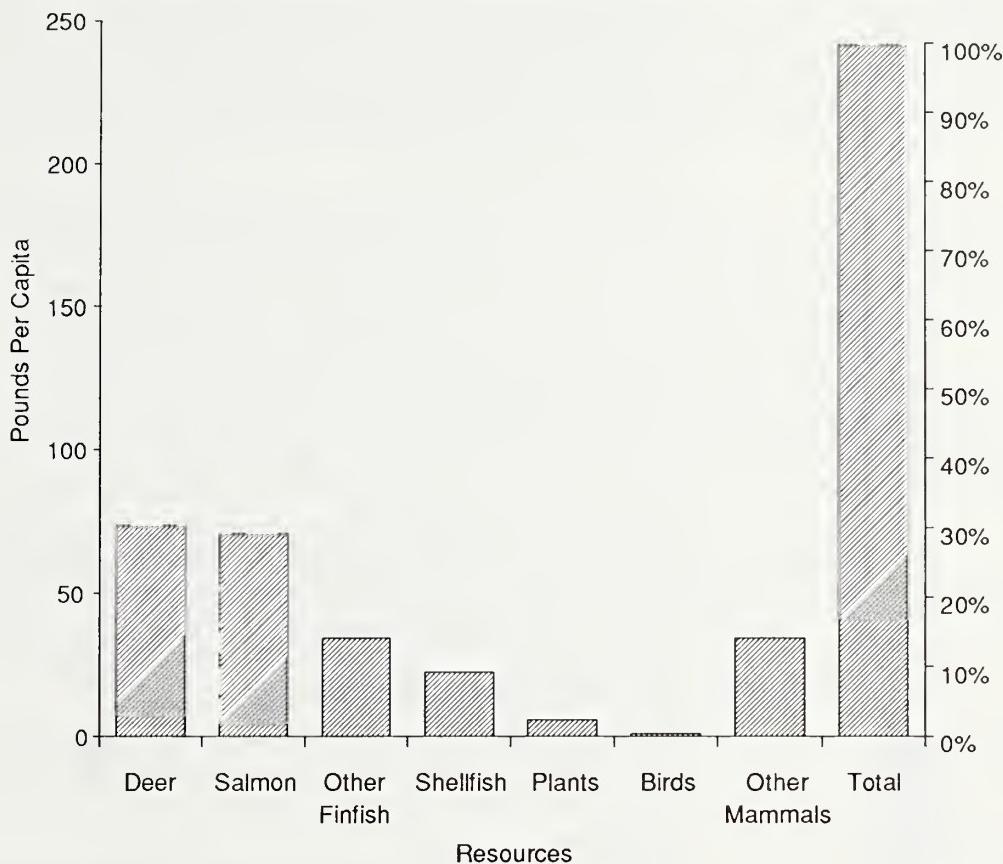
Tensions developed between the Russians and Tlingits, who attacked and captured the fort in 1802. Baranof returned in 1804 to retake the fort, engaging the Tlingits in a battle near the beach at Indian River. After several days of fighting and negotiations, the Tlingits abandoned the battle site and fled the area. They broke up into small groups based on clan lineage. One group went north up the west coast of Chichagof Island. Two groups went east through the mountains. One of the latter groups settled at the mouth of Sitkoh Bay near Point Craven. The village they built behind a steep rock face was named Sitkoh.

The Russians built a new settlement at the present location of Sitka, calling it New Archangel, and the Tlingits returned to Baranof Island (including Sitkoh Bay) in 1821. Sitka remained the capital of the Russian America until 1867 when the United States purchased Alaska. By then, many of the area's Tlingit population had moved to Sitka.

Sitka became the capital of the territorial government in 1884. Shipping, nearby gold strikes, a sawmill, and a salmon cannery that opened in 1878 all contributed to the economy. When the territorial capital moved Juneau in 1906, Sitka depended almost entirely on fishing and fish processing; the first cold storage plant opened in 1913, followed by more canneries and a short-lived whaling station.

Figure 3-25

### 1987 Harvest of Principal Subsistence Resources - Angoon



SOURCE: Kruse, J. and R. Frazier. 1988. Community Reports, Tongass Resource Use Cooperative Survey. Institute of Social and Economic Research, University of Alaska, Anchorage, in cooperation with ADF&G Division of Subsistence.

During World War II, military activities took place in Sitka. The creation of the Mt. Edgecumbe boarding school established the town as a center of Native education and arts. The lumber industry started growing in 1959 with the construction of the large APC pulp mill. Timber processing has remained a major economic sector in Sitka, although in recent years instability in the timber industry and labor disputes have resulted in large layoffs and economic hardship in the community.

The local economy includes a mixture of manufacturing (lumber, seafood), government, services, and fishing. The sector including trade and services has grown the fastest since 1970. Employment includes government (about 45 percent), services (20 percent), manufacturing (about 15 percent), and retail, (14 percent). Employment in the manufacturing and construction sectors is seasonal. In 1984, unemployment ranged between about 7 and 14 percent. The Tongass Resource Use Cooperative Study (TRUCS) reported a mean per capita income in 1987 of about \$14,500, higher than that for the region as a whole (Kruse and Frazier 1988).

Sitka residents harvest a wide variety of resources including deer, bear, goat, seal, waterfowl, furbearers, salmon, marine fish, and shellfish, among others. The annual harvest of subsistence resources was about 140 pounds per capita in 1987, dominated by salmon (28 percent), deer

### 3 Affected Environment

(27 percent), other finfish (25 percent), and shellfish (16 percent) (Figure 3-26). Subsistence provides about 15 percent of the household food supply.

#### Haines

Haines is located along the Lynn Canal on the narrow Chilkat Peninsula between Chilkoot and Chilkat Bays. The community is in the northern portion of Southeast Alaska.

The Chilkat Tlingits first occupied the Chilkat Valley area and controlled the trails between the coast and the Interior. Today, the Chilkat Tlingits are divided into two groups: the Chilkats of the Chilkat river drainage, with Klukwan being the major population center, and the Chilkoots living in and near Haines.

In 1879, John Muir and S. Hall Young, a Presbyterian missionary, visited the area looking for a mission site. Subsequently, the Willard Mission was built in 1881 and renamed Haines in 1884.

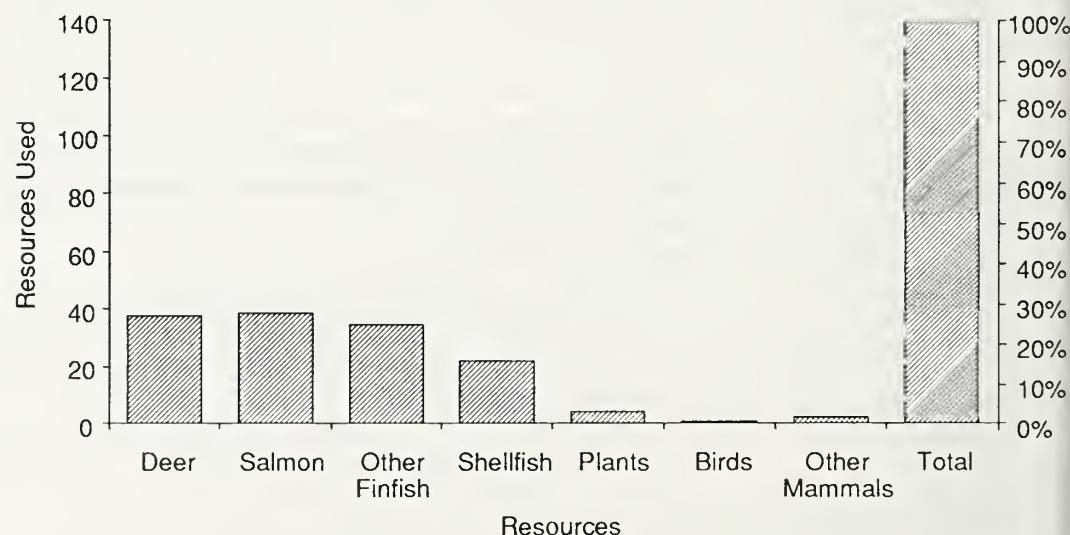
With the Klondike Gold Rush of 1898, Haines grew as a mining supply center. Gold was also discovered 36 miles from Haines in the Porcupine District in 1899. The area was mined actively until the mid-1920s. As a result of law enforcement problems associated with the gold rush, an army fort was established in 1905. The fort was deactivated in 1945. The community has since developed as a fishing port with some timber harvesting and processing which occasionally add to the community's employment opportunities.

The population of Haines and vicinity was 1,638 in 1988 with only 9 percent Alaska Native (ADF&G 1989). The major sources of employment include: government and schools, 23 percent; retail trade, 21 percent; construction, 9 percent; transportation, 8 percent; fishing and forestry, 5 percent; and tourism, 4 percent. Employment is highly seasonal in most industries with the exception of government and schools, and transportation. The average income of Haines' residents is over \$17,000 but 20 percent of the population had an income between \$5,000 and \$9,999 (ADF&G 1989).

Local subsistence resource use includes deer, bear, mountain goats, moose, salmon, other marine fish, eulachon, trout, and waterfowl. The annual harvest of subsistence resources was

Figure 3-26

#### 1987 Harvest of Principal Subsistence Resources - Sitka



SOURCE: Kruse, J. and R. Frazier. 1988. Community Reports, Tongass Resource Use Cooperative Survey. Institute of Social and Economic Research, University of Alaska, Anchorage, in cooperation with ADF&G Division of Subsistence.

about 105 pounds per capita in 1987, dominated by finfish other than salmon (36 percent), salmon (27 percent), and deer (15 percent) (Figure 3-27). Subsistence provides about 20 percent of the household food supply.

## Petersburg

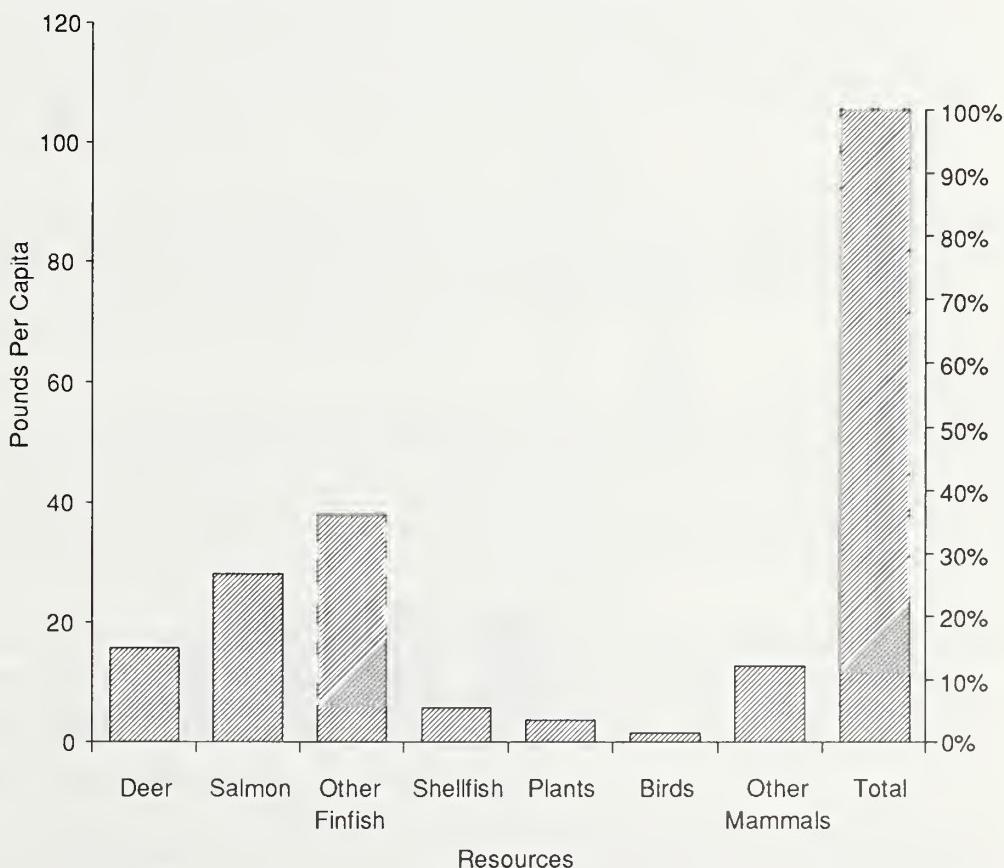
Located in the east-central portion of Southeast Alaska, Petersburg is situated on the northwest shore of Mitkof Island, at the north end of Wrangell Narrows. Historic use of the Petersburg area was made by the Tlingit people from nearby Kake. They had established a summer fishing camp on north Mitkof Island that was still active when white settlers began to move into the area. The area around present-day Petersburg has been in continuous use by Tlingits since prehistoric times.

In the late 1890s, Peter Buschmann, a Norwegian fisherman from Tacoma, homesteaded a site with good potential for a year-round fish-processing industry. He liked the well-protected harbor, available timber, and a ready supply of ice from the Le Conte Glacier, only 25 miles away. Buschmann started the Icy Strait Packing Company cannery and by 1900 a community had grown. In its first season of operation, the cannery packed 32,750 cases of salmon.

Buschmann's community, named Petersburg, grew rapidly. A sawmill, packing house, and docks were added and it soon became a center for fishing and fish processing. In contrast to the boom and bust mining towns, Petersburg became a stable year-round community. Except for a

Figure 3-27

### 1987 Harvest of Principal Subsistence Resources - Haines



SOURCE: Kruse, J. and R. Frazier. 1988. Community Reports, Tongass Resource Use Cooperative Survey. Institute of Social and Economic Research, University of Alaska, Anchorage, in cooperation with ADF&G Division of Subsistence.

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slight decline in the 1950s, the community grew steadily. Today, Petersburg is an active fishing community with fishing, fish processing, and timber being the predominant industries.

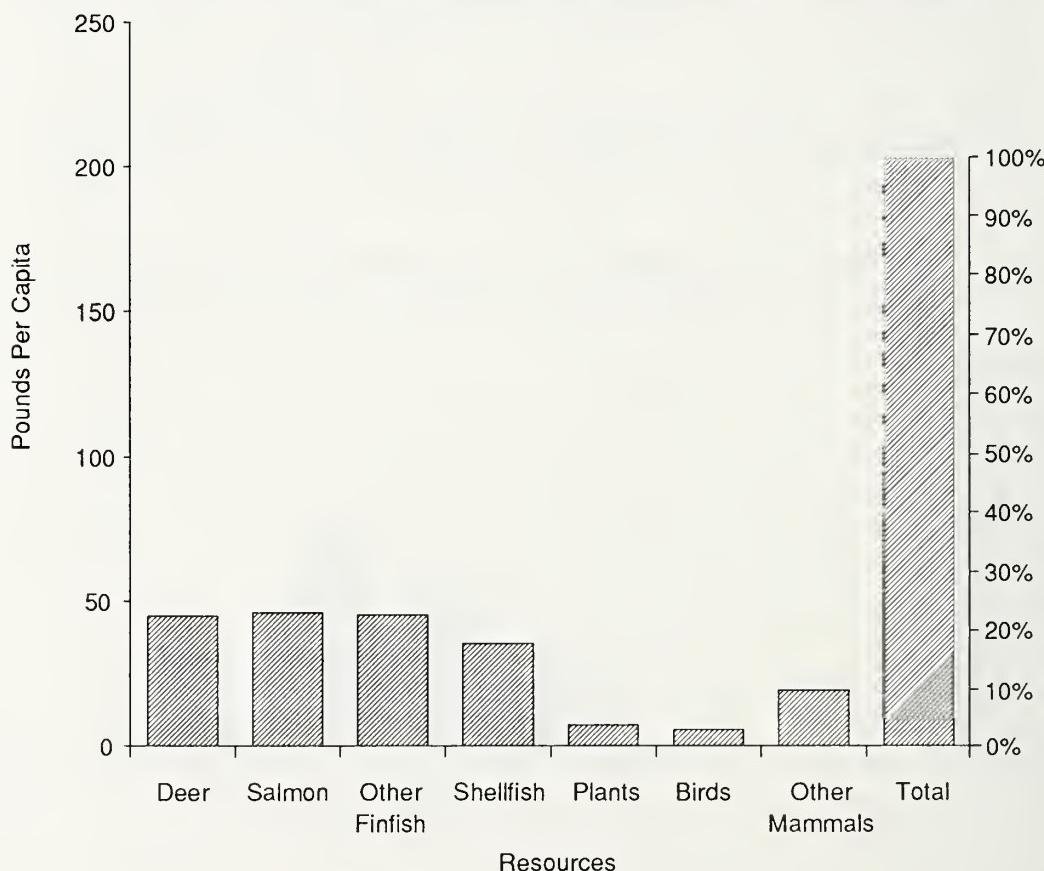
The 1987 estimated population of 3,282 residents (Smythe 1988) was about 13 percent Alaska Native (ADF&G 1989). The major sources of employment include seafood processing/manufacturing, 36 percent; government, 28 percent; retail trade, 13 percent; and construction, 9 percent. Employment in the manufacturing, retail, and construction sectors is seasonal. The average income is over \$19,000 and unemployment was about 16 percent of the total population. (ADF&G 1989).

Local subsistence resource use includes deer, bear, moose, salmon, other fish, waterfowl, clams, crabs, and berries. The annual harvest of subsistence resources was about 203 pounds per capita in 1987, primarily for salmon (23 percent), other finfish (22 percent), and deer (22 percent). (Figure 3-28). Approximately 30 percent of the household food supply is provided by subsistence resources.

#### Kake

Kake is located on northwestern Kupreanof Island. Kake was one of many villages occupied by the Kake Tlingits in the 18th and 19th centuries. In the mid-1800s, the Kake Tlingits inherited traditional and customary aboriginal rights to portions of Kuiu Island. These additional land

**Figure 3-28  
1987 Harvest of Principal Subsistence Resources - Petersburg**



SOURCE: Kruse, J. and R. Frazier. 1988. Community Reports, Tongass Resource Use Cooperative Survey. Institute of Social and Economic Research, University of Alaska, Anchorage, in cooperation with ADF&G Division of Subsistence.

rights are believed to have included the northern one-third of Kuiu and joint rights with the Klawock Tlingits to the central portion of the island.

With a major camp on Security Bay (VCU 400), the Kake people used Analysis Area 12 extensively for gathering, fishing, and hunting. Resources utilized included chum salmon, Sitka black-tailed deer, wild and cultivated plants, and a full range of invertebrates. Permanent and seasonal settlements were also located in Saginaw Bay (VCU 399), Port Camden (VCU 420) and in Rocky Pass (VCU 428). In the areas of Three-Mile Arm and Conclusion Island (VCUs 417, 418 and 419) they built cabins and smokehouses and practiced gathering, fishing, trapping, and hunting. The Kake Tlingits used the Washington Bay area (VCU 401) for harvesting herring. Rowan and Pillar Bays (VCUs 402 and 403) were additional gathering, fishing, hunting, and trapping areas.

Several historic Tlingit villages and fishing camps were consolidated during the late 1800s and early 1900s at the village of Kake, primarily in response to compulsory schooling laws. A school and store were built in 1891, and a cannery built in the area in 1912 still operates. A cold storage was built in 1980.

Historically, Kake's economy was based largely on commercial fishing of salmon, halibut, and trout from nearby waters. Logging has taken place in the area since the 1940s. In recent years, logging on land owned by the village corporation has provided some employment opportunities for Kake residents. Logging activities on both private and public lands have resulted in a local road system that residents use to access fishing, berrying, and grouse hunting areas.

The 1985 population of 634 was almost 70 percent Alaska Native. The major sources of employment include: fishing and fish processing, 28 percent; logging, 18 percent; longshoring, 13 percent; school, 8 percent; and government, 1 percent. Employment is highly seasonal with more than 50 percent unemployed during a 1985 survey. Although the average income was about \$16,000, almost 40 percent reported no income (ADF&G 1989). The Tongass Resource Use Cooperative Study (TRUCS) reported a mean per capita income of about \$9,000 in 1987 (Kruse and Frazier 1988).

In pursuing traditional subsistence, Kake residents hunt deer, bear, seals, grouse, and waterfowl, fish, trap furbearers, and gather shellfish, seaweed, and berries. The annual harvest of subsistence resources was about 160 pounds per capita in 1987, dominated by deer (24 percent), salmon (22 percent), and other finfish (21 percent) (Figure 3-29). Subsistence provides just over 20 percent of the household food supply.

## Klukwan

Klukwan is a Chilkat Indian village located next to the Chilkat River, about 22 miles north of Haines. Due to its strategic location in the Chilkat River valley, Klukwan has a long history as a trade center. Klukwan represents the population center of a Tlingit tribe that numbered over 1000 individuals in 1880 and occupied five villages in the Chilkat Valley and peninsula. Today, the Chilkat Tlingits are divided into two groups; the Chilkats of the Chilkat Valley, centered around Klukwan, and the Chilkoots who live in and near Haines on the Chilkat Peninsula.

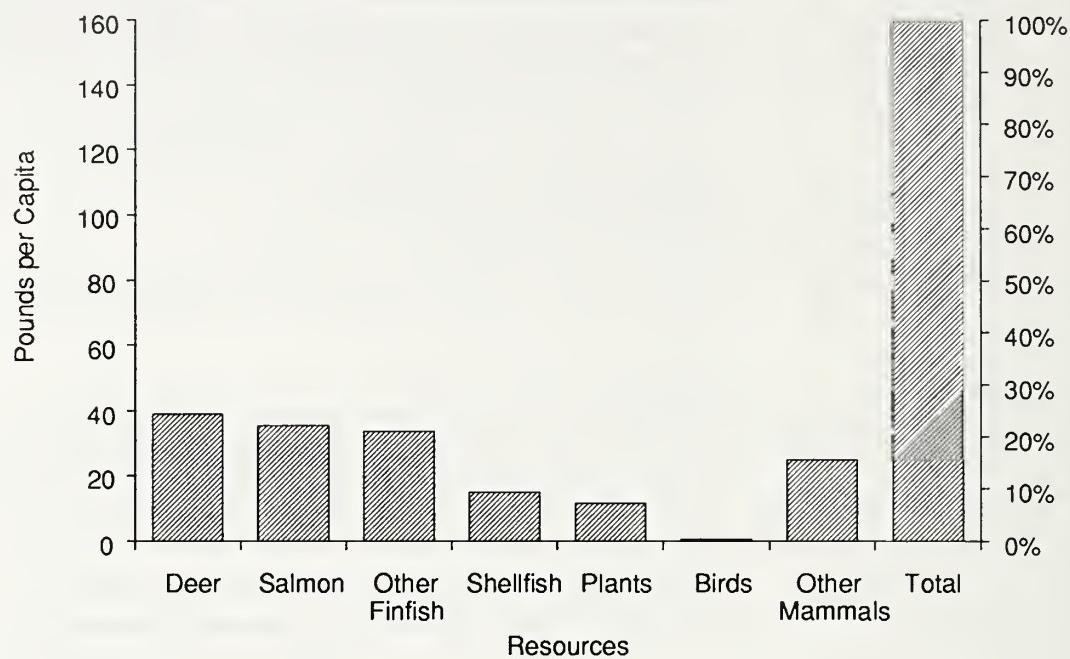
During the gold rush in the late 1800s, the Chilkat valley was a supply route for Dawson. Little development has taken place in the area since, despite the discovery of a rich iron ore deposit. Adjacent to Klukwan is the Alaska Chilkat Bald Eagle Preserve, which is composed of about 49,000 acres along the Chilkat River. The Chilkat Bald Eagle Preserve hosts the largest concentration of American bald eagles in the world.

In 1988 the population was 132, with 82 percent Alaska Native. The major sources of employment included: forest and fish products, 51 percent; logging camps and contractors, 24 percent; home crafts, 25 percent, and communications, 1 percent. Employment is highly seasonal in all sectors.

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Figure 3-29

#### 1987 Harvest of Principal Subsistence Resources - Kake



SOURCE: Kruse, J. and R. Frazier. 1988. Community Reports, Tongass Resource Use Cooperative Survey. Institute of Social and Economic Research, University of Alaska, Anchorage, in cooperation with ADF&G Division of Subsistence.

In pursuing traditional subsistence customs, residents of Klukwan hunt moose, deer, black bear, mountain goats, seals, grouse, and waterfowl, fish for salmon, eulachon, and other fish, and gather clams and berries. The annual harvest of subsistence resources was about 239 pounds per capita in 1987, dominated by salmon (52 percent), and other finfish (34 percent) (Figure 3-30). Subsistence provides 28 percent of the household food supply.

### Pelican

The community of Pelican is located on Lisianski Inlet on the northwest side of Chichagof Island. The area is believed to have been used as fishing camps and temporary villages by Tlingit people of the Chukanei Dee Clan from the Hoonah and Sitka areas (Figure 3-19).

The first development was a fish buying operation founded in 1938 and eventually a cold storage plant. With the addition of a sawmill, a water system, a school, and a post office, the town was established by 1941 and incorporated in 1943.

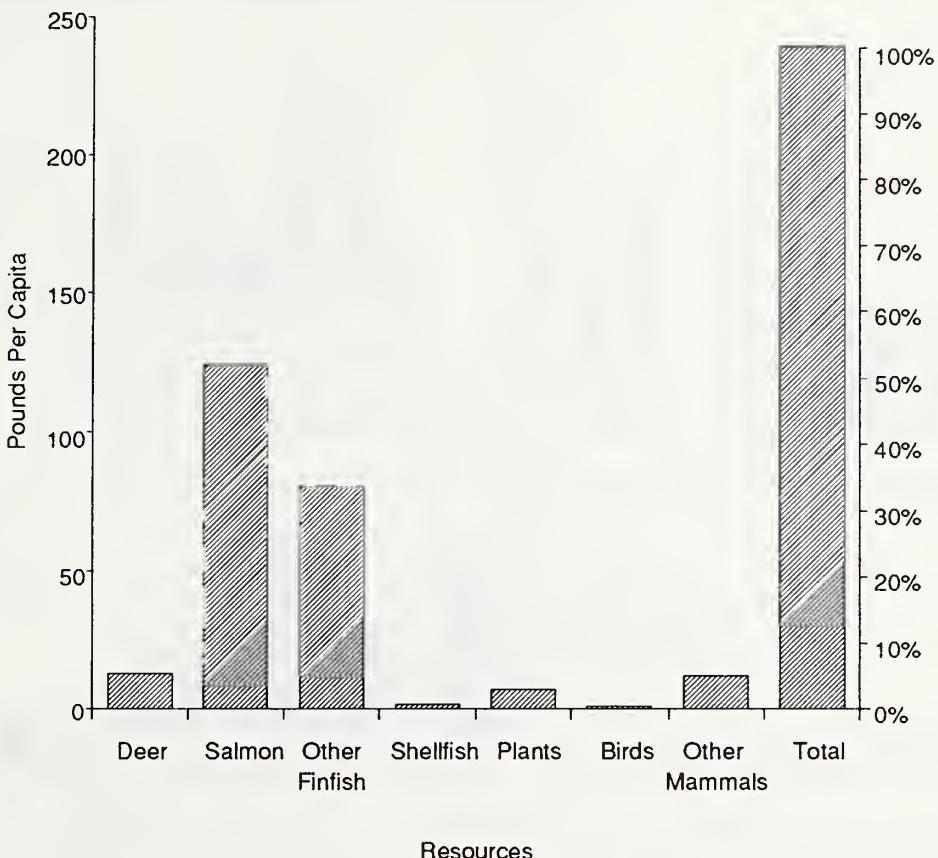
During summer months, Pelican's population increases by several hundred people as fishermen and cold storage plant workers arrive for the fishing season. In recent years timber harvesting has taken place in the vicinity of Pelican but this has not affected the development or the economy of the community.

In 1988 the population of Pelican was about 238 of which 27 percent were Alaska Native. The major sources of employment in 1980 included: transportation, 32 percent; fishing, 17 percent; retail, 13 percent; equipment repair, 9 percent; school, 8 percent; construction, 6 percent; and manufacturing, 3 percent. Employment is highly seasonal in all sectors except government.

Pelican residents hunt deer, bear and waterfowl, trap furbearers, catch salmon and other marine fish, and gather shellfish, herring eggs, plants, and berries. The annual harvest of subsistence

Figure 3-30

### 1987 Harvest of Principal Subsistence Resources - Klukwan



SOURCE: Kruse, J. and R. Frazier. 1988. Community Reports, Tongass Resource Use Cooperative Survey. Institute of Social and Economic Research, University of Alaska, Anchorage, in cooperation with ADF&G Division of Subsistence.

resources was about 355 pounds per capita in 1987, dominated by finfish other than salmon (33 percent), deer (30 percent), and salmon (17 percent) (Figure 3-31). Subsistence provides over 55 percent of the household food supply.

### Use of Analysis Area VCUs

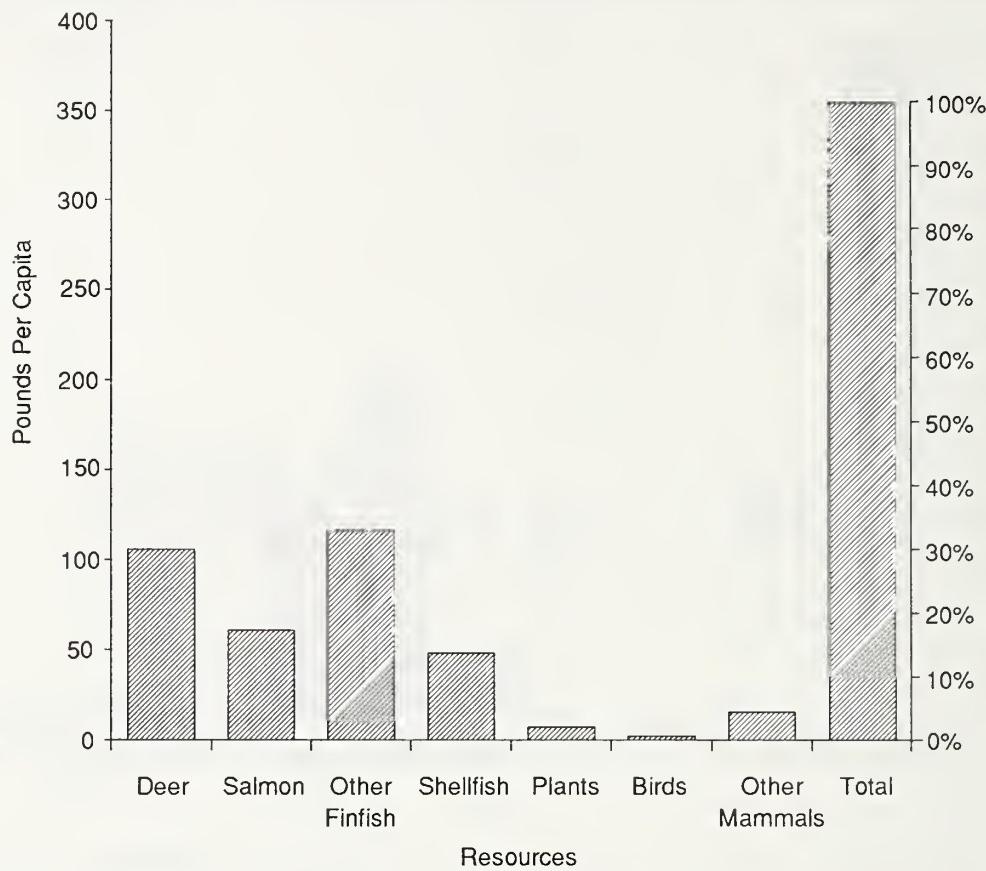
All of the VCUs in Analysis Area 2 are used by more than one user community. Subsistence use areas in Analysis Area 2 are shown on the Important Subsistence Use Map folded at the back. This map only shows use of the Analysis Area for subsistence harvest of deer, salmon, and furbearers. The map information is based on University of Alaska, Forest Service, Region 10, and ADF&G subsistence survey data. Data sources include the TRUCS survey and ADF&G technical reports. (Complete citations are found in Chapter 7, Literature Cited.) All the communities and households that use an area have been given equal weight in the mapping process. Therefore, the map shows areas of subsistence use without reference to which communities may be using a particular location and without indications of the intensity or frequency of that use. All inventory data, including both intensive and extensive use areas, were considered in developing the subsistence use map. These data are available for review in the Planning Record.

Figure 3-32 shows that Hoonah residents have historically hunted deer in more than 85 percent of the VCUs within Analysis Area 3. They also catch salmon in more than 70 percent of the

### 3 Affected Environment

Figure 3-31

#### 1987 Harvest of Principal Subsistence Resources - Pelican



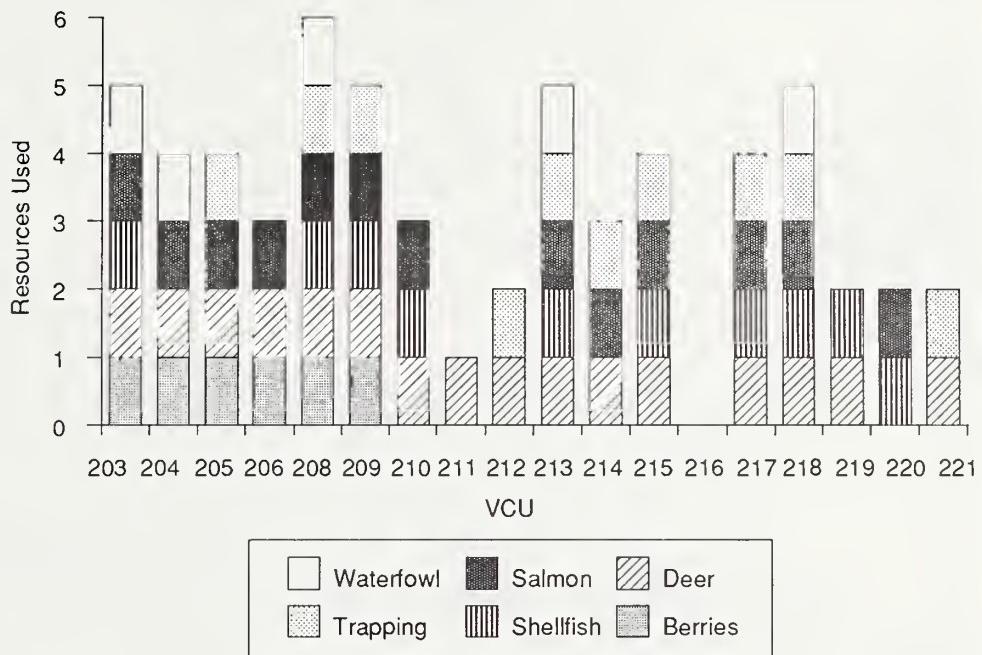
SOURCE: Kruse, J. and R. Frazier. 1988. Community Reports, Tongass Resource Use Cooperative Survey. Institute of Social and Economic Research, University of Alaska, Anchorage, in cooperation with ADF&G Division of Subsistence.

VCUs. Hoonah subsistence users trap furbearers and gather shellfish in about half of the VCUs, and they hunt waterfowl and gather berries in about a third of them. Primarily access to subsistence areas is by boat and vehicle.

Figure 3-33 shows that most of Analysis Area 3 is an important subsistence area for Hoonah residents. The core subsistence use areas are those areas that are most important to the residents of Hoonah for gathering of subsistence resources. Most of the households surveyed in the TRUCS sample hunted deer in VCUs 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, and 215. Hunters use vehicles on the road system and boats to access to these more heavily used deer hunting areas. Hunting areas accessed by vehicle include VCUs 204, 205, 206, 207, 208, 209, 210, 215, 217, 218, and 219. All VCUs except VCU 216 are accessed by boat. Corridors along the roads and the beach fringe are most heavily hunted. Seagull, Game, and Spasski Creek areas, along with Whitestone Harbor and Freshwater Bay, are popular deer hunting areas for Hoonah residents. TRUCS map data show that Seagull, Game, Spasski, Gartina, Suntahen, and Iyouktug Creeks, and Indian River are key subsistence salmon streams for Hoonah residents.

Tenakee Springs residents have historically hunted deer in more than 70 percent of the VCUs within the analysis area. They trap furbearers in just over one-quarter of the VCUs, and catch

Figure 3-32

**Hoonah Use of Analysis Area VCUs**

SOURCE: Kruse, J. and R. Frazier. 1988. Community Reports, Tongass Resource Use Cooperative Survey. Institute of Social and Economic Research, University of Alaska, Anchorage, in cooperation with ADF&G Division of Subsistence.

Schroeder, B. and M. Kookesh. 1987. Areas of Subsistence Use—Hoonah. ADF&G, Division of Subsistence. Unpublished Draft.

salmon and collect shellfish in just under one-quarter of them. Waterfowl are hunted in VCUs 219 and 220 by residents of Tenakee Springs (Figure 3-34).

Most of the households surveyed in the TRUCS sample hunted deer in the beach fringe of Analysis Area 3 and in the Indian River valley. Hunters access these more heavily used hunting areas with boats and with ORVs along the beaches and up the Indian River. They also hunt deer along the beach fringe north to False Bay. Crabs, clams and cockles are widely harvested in tidal flats throughout Tenakee Inlet. Trapping is primarily confined to the beach fringe.

Residents of Wrangell have historically hunted deer in all VCUs in Analysis Area 3 except for VCUs 211, 216, and 221. They gather shellfish in VCUs bordering the east side of Port Frederick. Salmon are most frequently caught at the mouth of Port Frederick (VCUs 205 and 206) and along Chatham Strait from False Bay to the mouth of Tenakee Inlet including Freshwater Bay (VCUs 210, 212, 213, 214, 215, 217, 218, and 219) (Figure 3-35).

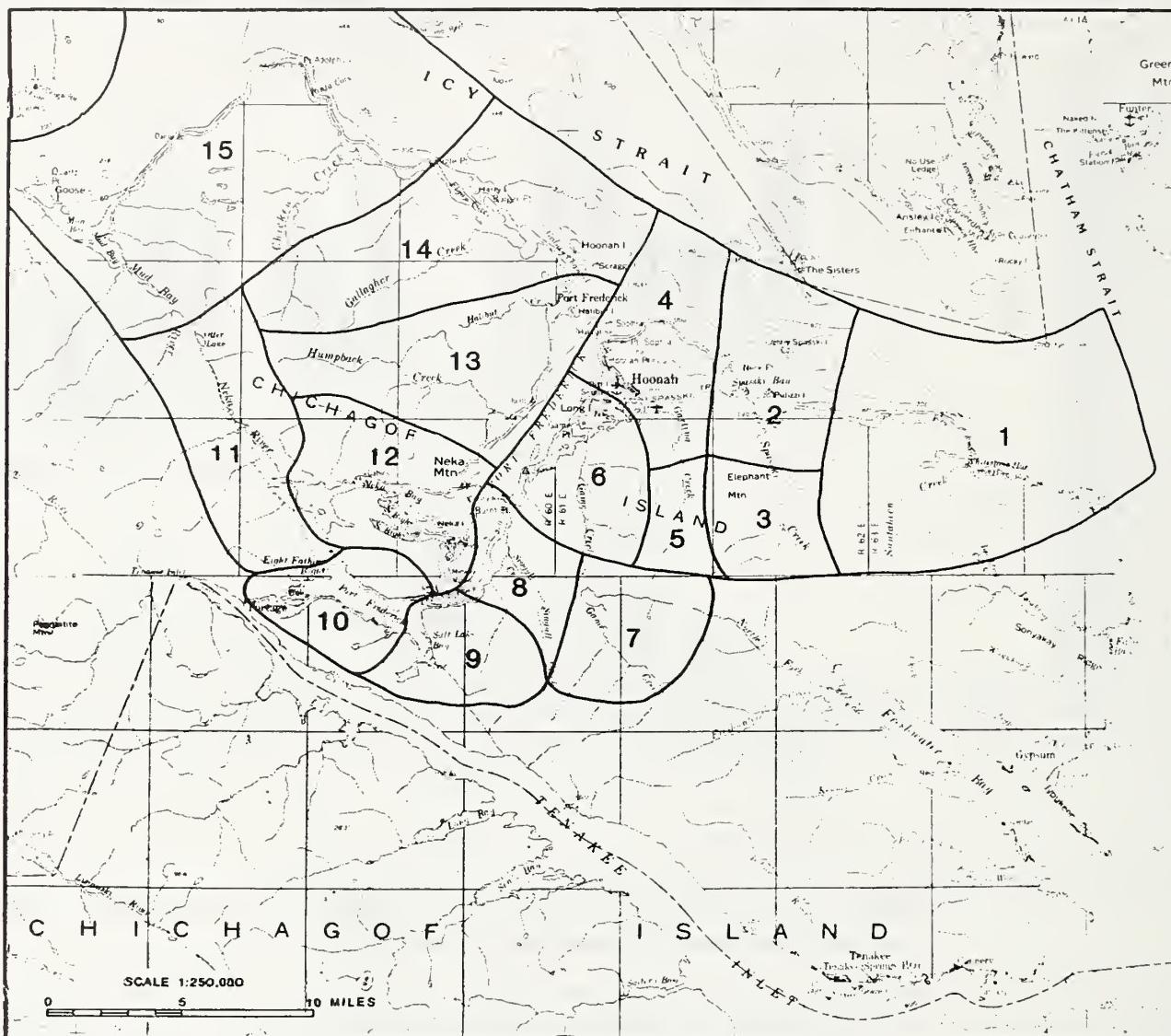
Angoon residents have historically gathered shellfish along Tenakee Inlet in VCUs 219 and 220, and hunted deer on the eastern edge of the Analysis Area (VCUs 210, 211, 212, and 213). Residents of Sitka and Haines hunt deer in all of the VCUs in Analysis Area 3. Gustavus residents have hunted deer primarily in Port Frederick (VCUs 203, 204, 205, 206, and 207).

Petersburg residents have hunted deer in Port Frederick (VCUs 203 and 204), along Icy and Chatham Straits (VCUs 208, 209, 210, 211, and 212) and in Tenakee Inlet and the mouth of Freshwater Bay (VCUs 218, 219, 220, and 221). Residents of Kake have historically hunted

### 3 Affected Environment

Figure 3-33

#### Hoonah Subsistence Core Use Area



DIVISION OF THE CORE AREA  
NEAR HOONAH USED BY  
RESIDENTS FOR SUBSISTENCE  
HARVEST INTO 15 STUDY UNITS.

#### GEOGRAPHICAL UNIT BOUNDARY

This map delineates the 15 geographical units that comprise the Hoonah core area; these are used to analyze frequency of subsistence use over time. The same units are found on map 16 at a different scale.

Sources: Bob Schroeder and Matt Kookesh, Field research 1986, 1987.

Unit boundaries were developed through key informant interviews with Hoonah residents. Boundaries correspond to Forest Service management units and ADF&G management units where possible.

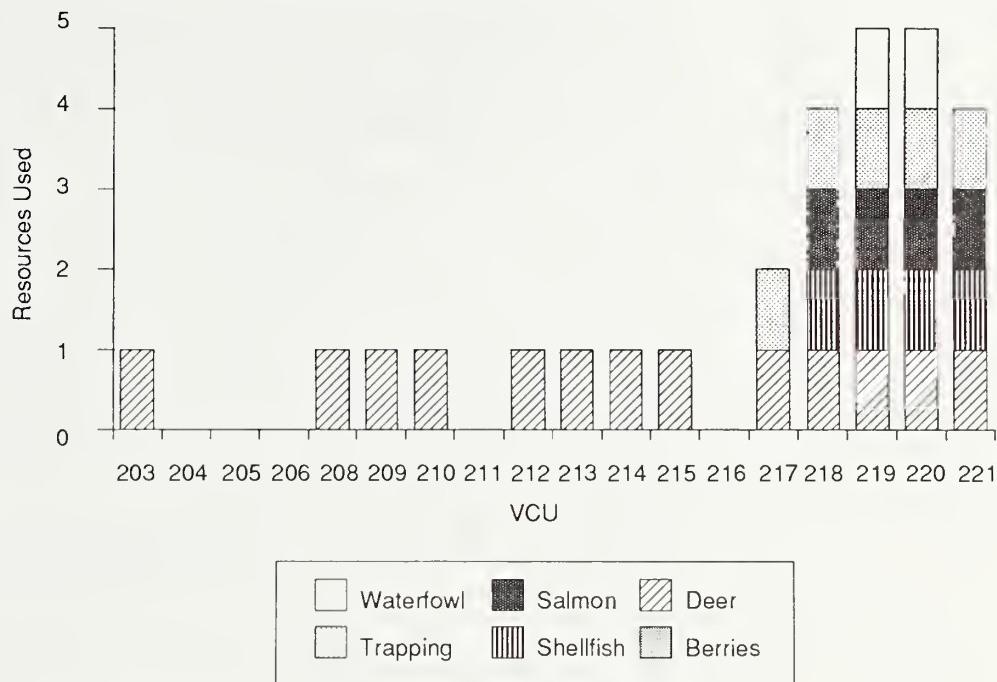


STATE OF ALASKA  
DEPT. OF FISH AND GAME  
Subsistence Division

SOURCE: ADF&G Subsistence Division.

Figure 3-34

### Tenakee Springs Use of Analysis Area VCUs



SOURCE: Kruse, J. and R. Frazier. 1988. Community Reports, Tongass Resource Use Cooperative Survey, Institute of Social and Economic Research, University of Alaska, Anchorage, in cooperation with ADF&G Division of Subsistence.

Kookesh, M. and K. Leghorn. 1985. Timber Management and Fish and Wildlife Utilization in Selected Southeast Alaska Communities: Tenakee Springs, Alaska. ADF&G, Division of Subsistence, Technical Paper No. 138.

deer in Freshwater Bay and Tenakee Inlet (VCUs 213, 214, 215, 217, 218, 219, 220, and 221). The people of Klukwan have historically hunted deer in Port Frederick and Spasski Bay (VCUs 204, 205, 206, and 207). VCU-specific use information for Analysis Area 3 is not available for the community of Pelican.

Subsistence hunters may transport vehicles to Hoonah on the Alaska State Ferry system. From Hoonah many of the VCUs may be accessed by vehicle over the existing road system. ATVs may also be transported on the ferry system and unloaded at Tenakee Springs where hunters can then access the Indian River road system. Some hunters access the road system at other points by transporting ATVs in skiffs, however, most subsistence users simply use private boats to access subsistence use areas in Analysis Area 3. Residents of communities further away from Analysis Area 3 may hunt deer or gather other subsistence resources when the commercial fishing fleet is in the area.

The demand for deer has increased in recent years. Both the number of deer hunters (Table 3-12) and the number of deer harvested (Table 3-10) have nearly doubled in Major Harvest Areas 35 and 36 (Figure 3-2) between 1984 and 1987. These increases are partially a result of increased access due to road building on private and federal lands. Changes in hunting regulations have also contributed to the increase in the number of deer harvested. Since the number of deer hunters includes both the sport and subsistence hunters, an increase in the number of hunters can lead to an increase in the competition for the subsistence resource of deer.

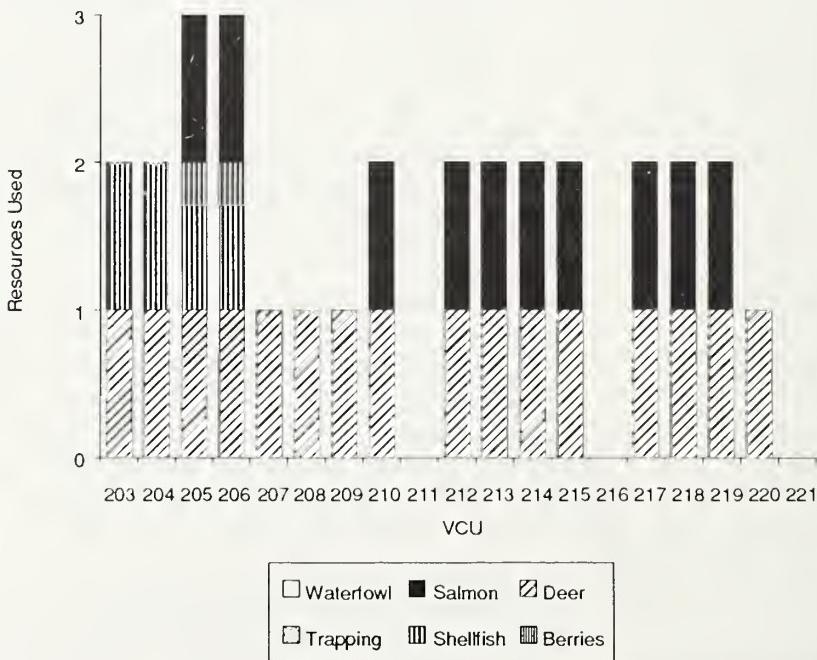
### 3 Affected Environment

Table 3-33 provides information on the numbers of deer hunter days in Major Harvest Area 36. It also shows the numbers of deer harvested in Major Harvest Area 36 during the period 1985 to 1987. Although both the deer hunter days and deer harvested for Hoonah increased between 1985 and 1986, they decreased considerably (particularly the number of deer harvested) between 1986 and 1987. While the average number of hunter days per deer harvested was about 0.9 in 1985, it increased to 4.9 in 1986 and then dropped somewhat to 3.6 in 1987. In both 1986 and 1987, Hoonah's average considerably exceeded that for the unit as a whole. For Tenakee Springs, the average climbed sharply from 2.4 to 6.0 and then dropped back to 2.7. By contrast, the average for Juneau-Douglas raised gradually from 2.4 to 2.7, ending at 3.3.

Table 3-34 provides information on the numbers of deer hunter days in Major Harvest Area 35. It also shows the numbers of deer harvested in Major Harvest Area 35 during the period 1985 to 1987. Although both the deer hunter days and deer harvested for Hoonah increased between 1985 and 1986, they declined considerably, particularly the number of deer harvested, between 1986 and 1987. While the average number of hunter days per deer harvested was just over 1.7 in 1985, it increased to over 3 in 1986 and 4.3 in 1987. By contrast, the deer hunter days for Juneau-Douglas almost quadrupled during the same period, and the average number of hunter days per deer harvested increased from just over 2 in 1985 to 3.2 in 1986 and then decreased to 2.9 in 1987. Analysis of 1987 deer harvest data shows that almost 80 percent of deer harvested were taken within a 10-mile radius of Hoonah.

Major Harvest Area 35 includes the northwestern portions of Analysis Area 3 and most of Analysis Area 2. The village of Hoonah is in Major Harvest Area 35. Major Harvest Area 36 includes the Chatham Strait, Freshwater Bay, and Tenakee Inlet portions of Analysis Area 3 as

Figure 3-35  
Wrangell Use of Analysis Area VCUs



SOURCE: Kruse, J. and R. Frazier. 1988. Community Reports, Tongass Resource Use Cooperative Survey, Institute of Social and Economic Research, University of Alaska, Anchorage, in cooperation with ADF&G Division of Subsistence.

Cohen, K.A. 1989. Wrangell harvest study: A comprehensive study of wild resource harvest and use by Wrangell residents. ADF&G, Division of Subsistence, Juneau, AK. Technical Paper No. 165.

Table 3-33

**Deer Hunter Days, Harvest, and Average Number of Hunter Days to Harvest in Major Harvest Area 35, 1985-1987<sup>1</sup>**

	1985		1986		1987				
	Hunter Days	Deer Harvest	Average Days	Hunter Days	Deer Harvest	Average Days	Hunter Days	Deer Harvest	Average Days
Hoonah	1,169	670	1.7	3,737	1,198	3.1	3,273	757	4.3
Juneau-Douglas <sup>2</sup>	585	285	2.1	883	276	3.3	2,239	762	2.9
Tenakee Springs	0	0	0	0	0	0	14	5	0.2
Ketchikan <sup>2</sup>	7	0	0	179	94	1.9	15	10	1.5
Other Southeast									
Subsistence <sup>3</sup>	443	194	2.3	1,023	137	7.5	854	325	2.6
Other Nonsubsistence	52	16	3.3	46	32	1.4	12	2	6.0
Total	2,256	1,165	1.9	5,868	1,737	3.4	6,407	1,861	3.4

SOURCE: SEIS Planning Record.

<sup>1</sup> The location of Major Harvest Area 35 is shown in Figure 3-2.

<sup>2</sup> Juneau-Douglas and Ketchikan are not subsistence communities.

<sup>3</sup> Other Southeast Alaska subsistence communities that harvest deer in Major Harvest Area 35 may include Angoon, Elfin Cove, Gustavus, Haines, Kake, Klukwan, Pelican, Petersburg, Sitka, and Wrangell.

well as other analysis areas that border on Tenakee Inlet. The community of Tenakee Springs is in Major Harvest Area 36.

In 1988, Alaska Fish and Game redrew the boundaries of the Major and Minor Harvest Areas in Major Harvest Areas 35 and 36 (Figure 3-3) to more accurately reflect use patterns. At the same time the sport hunting regulations were changed to shorten the season and lower the bag limits in order to reduce competition with subsistence hunters. Therefore, 1988 data on hunter days and number of deer harvested are not directly comparable with previous years. In 1988, there were a total of 3,909 hunter days in Analysis Area 3 of which 2,154 were attributable to subsistence communities, and a total of 1,357 deer harvested of which 799 were harvested by subsistence communities. Changes from previous years to 1988 are obscured by the new reporting boundaries. There have also been changes in sport hunting regulations which limited the sport hunt.

With regular ferry service and vehicle access at Hoonah and passenger and ATV service at Tenakee Springs, Analysis Area 3 is more accessible to residents of other parts of Southeast Alaska than most places in the Tongass National Forest. In particular, the construction of logging roads radiating from Hoonah allows better access that has attracted additional hunters from other places, including nonsubsistence communities. The result has been an increase in competition for resources important to Hoonah hunters. Hoonah residents have traditionally hunted close to the village, and with their limited incomes often lack the means to travel farther away for their subsistence harvests. Analysis of 1987 deer harvest data show that almost 80 percent of the deer harvested in Analysis Area 3 were taken within a 10-mile radius of Hoonah.

Residents of both Hoonah and Tenakee Springs have expressed concerns about the effects of logging activities and fish and wildlife management on subsistence resources. They have particularly expressed concern about the six deer bag limit for residents of nonsubsistence areas. ADF&G has responded to this concern by lowering the limit for nonsubsistence users from six

### 3 Affected Environment

to three deer. The reasons that residents of Hoonah and Tenakee Springs have given for no longer hunting deer in some areas include an absence of deer, too many hunters, area is logged or developed, and no access.

Residents of Tenakee Springs have specifically spoken against connecting the Game Creek and Indian River road systems. Residents of all the communities that use Analysis Area 3 are concerned about the impacts that forestry management and fish and wildlife management activities on both federal and private land may have on the availability of subsistence resources. They are especially concerned about effects on habitat, the effects of hunting and fishing regulations, and the effects additional access would have on important fish and wildlife subsistence species. Some subsistence community residents are concerned about their ability to continue to harvest important subsistence resources in this subsistence area. Chapter 4 evaluates the potential site-specific effects on subsistence use for each proposed alternative in this important subsistence area.

Table 3-34

#### Deer Hunter Days, Harvest, and Average Number of Hunter Days to Harvest in Major Harvest Area 36, 1985-1987<sup>1</sup>

	Hunter Days	1985 Deer Harvest	Average Days	Hunter Days	1986 Deer Harvest	Average Days	Hunter Days	1987 Deer Harvest	Average Days
Hoonah	75	82	0.9	103	21	0	501	138	3.6
Juneau-Douglas <sup>2</sup>	878	361	2.4	1,902	694	2.7	2,496	752	3.3
Tenakee Springs	358	149	2.4	520	87	6.0	310	116	2.7
Ketchikan <sup>2</sup>	0	0	0.0	145	34	4.3	41	5	8.2
Other Southeast									
Subsistence <sup>3</sup>	215	144	1.5	231	99	2.3	337	276	1.2
Other Nonsubsistence	48	20	2.4	13	0	0	18	9	2.0
Total	1,574	1,117	1.4	2,914	935	3.1	3,703	1,296	2.9

SOURCE: SEIS Planning Record.

<sup>1</sup> The location of Major Harvest Area 36 is shown in Figure 3-2

<sup>2</sup> Juneau-Douglas and Ketchikan are not subsistence communities.

<sup>3</sup> Other Southeast Alaska subsistence communities that harvest deer in Major Harvest Area 36 may include Angoon, Elfin Cove, Gustavus, Haines, Kake, Klukwan, Pelican, Petersburg, Sitka, and Wrangell.

*Sitka Black-tailed Deer are  
an Important Subsistence  
Resource.*





# **Chapter 4**

## **Environmental Consequences**





# Chapter 4

## Environmental Consequences

Chapter 4 provides the scientific and analytic basis for comparing the environmental effects of the alternatives described in Chapter 2, Alternatives Including the Proposed Action. The evaluation of the alternatives and their relationship to the issues introduced in Chapter 1 is the focus of Chapter 4.

Chapter 4 is presented in four sections. The first is an evaluation of the resource categories described in Chapter 3, (i.e., soils, vegetation, wildlife, etc.). Within each resource category certain impacts are common to all alternatives. These impacts are evaluated together. Then the effects of each alternative on that resource category are evaluated. These site-specific consequences are discussed in terms of short-term effects.

The second part of Chapter 4 is titled Reasonably Foreseeable, Long-Term, and Cumulative Effects. The reasonably foreseeable, long-term impacts for the SEIS alternatives are presented as well as the effects of adjacent harvest, past harvest, and harvest anticipated through

*Timber Harvest in Suntaheen Creek Watershed*



# 4 Environmental Consequences

the life of the APC Contract (year 2011). The assumptions used in these long-term projections are displayed at the beginning of this second part of Chapter 4.

The third section of Chapter 4 includes Other Environmental Considerations that must be addressed under NEPA but do not fall under the environmental resource categories discussed in Chapter 3. These topics include unavoidable adverse environmental effects, the relationship between short-term use and the maintenance and enhancement of long-term productivity; the irreversible and irretrievable commitment of resources; possible conflicts between alternatives and other land uses; energy requirements; and natural, depletable resource requirements.

The fourth part of Chapter 4 discusses mitigation measures. It reviews those measures already adopted to avoid or reduce impacts, including the standards and guidelines in use by policy. It then summarizes the site-specific and impact-specific mitigation measures that will be applied.

## Resource Categories

### Soils

Certain management activities can increase the frequency and magnitude of soil erosion. Road construction produces the greatest opportunity for chronic soil loss and sedimentation. About 90 percent of this soil loss occurs during the first three years after construction. The rate of soil loss then decreases as vegetative cover is reestablished on slopes and as less soil is available to erode.

Landslides can be triggered by removing vegetation or by altering mechanical support (e.g., making cutbanks along road alignments). The chance of stream-caused erosion increases when braided stream channels are logged or crossed with roads.

In Analysis Area 3, all soil areas classified as having an extreme hazard of mass wasting (slopes greater than 75 percent) were eliminated from consideration when developing road systems and harvest units. Therefore, there are no roads or harvest units proposed on areas of extreme soil hazard in any of the alternatives. This greatly reduces the potential to negatively impact long-term soil productivity. All the proposed action alternatives will have a similar, minor effect on soils.

There remains a potential for landslides and surface erosion on areas classified as having a moderate or moderately high soil hazard. These areas, however, can be managed without measurable increases in chronic soil erosion by careful application of project standards and guidelines and timely application of the erosion control provisions of the Timber Sale Contract. Standards and guidelines frequently include modifications to the harvest system such as split line or full suspension yarding. These measures are identified on the Unit Cards which are reproduced in Appendix A-1. Contractual provisions that are employed to protect the soil resource include revegetation (grass seeding and fertilizing) of all cut and fill slopes, landings, and other yarding disturbances, as well as installing water bars on all temporary roads.

Although the above measures are expected to effectively protect against any significant effects on soils, there is a possibility that management activities can contribute to the risk of soil movement. Because of this it is useful to look at the acres of soil disturbance within various soil hazard rating areas as a means of comparing alternatives. Table 4-1 summarizes this information.

The potential impact each alternative has on soil productivity is related to the total acres harvested and miles of road built. However, the effects will vary widely from location to location, depending on such factors as the kind of yarding system employed (which bears directly on the amount of soil disturbance) and soil type. Logging reduces soil productivity in areas used for roads, landings, skid trails, skyline corridors, and borrow sites. Those areas generally amount to between 5 and 10 percent of most harvest units.

Table 4-1  
**Proposed Timber Harvest by Soil Hazard Class (Acres)**

	VCU	Low/ Medium	High	Total
<i>Alternative 1</i>				
204	21	0	21	
210	82	0	82	
212	748	113	861	
213	97	20	117	
214	214	82	296	
215	51	14	65	
217	51	5	56	
218	0	20	20	
219	78	13	91	
Total	1,342	267	1,609	
Percent	83.4	16.6		
<i>Alternative 2</i>				
212	275	23	298	
214	143	35	178	
Total	418	58	476	
Percent	87.8	12.2		
<i>Alternative 3</i>				
203	620	105	725	
204	776	309	1,085	
208	28	86	114	
209	84	0	84	
210	296	0	296	
212	315	14	329	
217	23	110	133	
218	455	92	547	
Total	2,597	716	3,313	
Percent	78.4	21.6		

Continued

## 4 Environmental Consequences

Table 4-1 (Continued)  
**Proposed Timber Harvest by Soil Hazard Class (Acres)**

VCU	Low/ Medium	High	Total
<i>Alternative 4</i>			
209	0	181	181
210	500	0	500
211	246	0	246
212	100	0	100
213	153	0	153
215	301	108	409
217	23	110	133
218	614	101	715
219	85	0	85
<b>Total</b>	<b>2,022</b>	<b>500</b>	<b>2,522</b>
Percent	80.2	19.8	
<i>Alternative 5</i>			
204	466	289	755
209	0	181	181
210	348	0	348
212	100	0	100
213	153	0	153
215	215	108	323
217	0	60	60
218	389	25	414
219	85	0	85
<b>Total</b>	<b>1,756</b>	<b>663</b>	<b>2,419</b>
Percent	72.6	27.4	
<i>Alternative 6</i>			
204	272	422	694
210	320	0	320
211	87	0	87
213	188	0	188
217	23	50	73
219	115	0	115
<b>Total</b>	<b>1,005</b>	<b>472</b>	<b>1,477</b>
Percent	68.1	31.9	

SOURCE: SEIS Planning Record

## Vegetation

Although all of the action alternatives would affect the vegetation types on National Forest lands similarly, the extent and magnitude of their effects would be proportional to the acres of land disturbed in the Analysis Area. Tables 4-2 through 4-7 show the percentage of National Forest land in each VCU and total land area in Analysis Area 3 disturbed by timber harvest under the alternatives. The acres of timber harvest proposed by the alternatives range between 2,704 under Alternative 2 to 7,920 acres under Alternative 3. Although Alternative 3 would harvest over twice the acreage that Alternative 2 would, the amount of land that would be disturbed in the Analysis Area only differs by 2.8 percent. On National Forest land, Alternative 2 would disturb 3.3 percent of the acreage, while Alternative 3 would disturb only 6.6 percent. Consequently, the potential effects of the action alternatives on vegetation, described below, are nearly the same. No harvest is expected to occur on Native Corporation or other lands during the SEIS time frame. The cumulative timber harvest for those VCUs where previous harvest took place on Native Corporation or other lands is presented in Tables 4-2 through 4-7 in order to show the effect of the alternatives on the total land area in Analysis Area 3.

The short-term effect on vegetation in the Analysis Area resulting from timber harvest activity would be the conversion of climax forest stands into young, successional stands. The removal of the forest overstory would change the microsite conditions that had influenced the species composition and density of the understory vegetation. Species that thrive best in the shaded and protected environment under the mature forest, such as some mosses, liverworts, lichens, herbs, and shrubs, would find themselves without the beneficial influence of the trees, and would be reduced in vigor or competitive ability. Some species survive in the understory, but when released from the influence of the forest, become vigorous competitors for growth space. Examples are huckleberries and western hemlock trees. Other species are not notable in the forest understory (including some trees, such as Sitka spruce), but are able to develop rapidly from seed in open conditions.

The successional changes which occur in the forest after harvest are described in the Long-Term section of this chapter, under Vegetation/Timber. Because some sites are more productive than others, they are rated by a site index and are assigned a site class of low, medium, or high. The site index is based on the expected height to which a tree will grow on that site in a given number of years (in this case, 100 years). For example, on a “low” site, trees would be expected to grow between 50 and 70 feet in 100 years. The proposed harvest by site class for all alternatives in Analysis Area 3 is shown in Table 4-8.

## 4 Environmental Consequences

Table 4-2  
Effects of Harvest on VCU Land Area, CFL, and Operable CFL  
for Alternative 1

VCU <sup>1</sup>	Cumulative Harvest (acres)	Percent Operable CFL	Percent CFL	Percent Land
<i>National Forest Land</i>				
204	453	4.7	4.0	1.6
208	90	4.7	4.5	1.4
209	1,857	33.3	28.8	14.1
210	1,202	17.8	17.3	9.5
212	1,139	19.5	16.4	8.6
213	181	6.4	6.4	4.7
214	547	22.3	18.6	8.0
215	1,747	17.1	15.1	7.5
217	1,257	20.7	19.4	12.3
218	1,824	19.6	19.3	9.6
219	337	8.9	8.9	5.6
Subtotal <sup>2</sup>	10,634	11.7	10.7	5.1
<i>Native Corporation and Other Lands<sup>3</sup></i>				
205	1,938	70.1	60.7	24.9
206	1,108	26.9	26.9	22.8
207	2,777	31.3	30.4	25.6
208	35	26.5	26.5	26.5
219	80	17.2	17.2	10.9
220	448	32.2	31.8	15.3
Subtotal <sup>4</sup>	6,386	31.5	29.9	18.5
Total <sup>5</sup>	17,020	15.3	14.1	7.0

SOURCE: Tongass Land Management Plan aerial photo points database, Chatham Area Supervisor's Office, Sitka, AK.

<sup>1</sup> No Forest Service harvest is proposed in the SEIS for VCUs 203, 205-207, 211, 216, 220, and 221 on National Forest land.

<sup>2</sup> These values include all National Forest land in the analysis area.

<sup>3</sup> No harvest on Native Corporation or other lands is expected during the SEIS time frame; data represents past cumulative harvest on these lands.

<sup>4</sup> These values include all Native Corporation land in the analysis area.

<sup>5</sup> These values include all National Forest and Native Corporation land in the analysis area.

Table 4-3

**Effects of Harvest on VCU Land Area, CFL, and Operable CFL for Alternative 2**

VCU <sup>1</sup>	Cumulative Harvest (acres)	Percent Operable CFL	Percent CFL	Percent Land
<i>National Forest Land</i>				
209	1,568	28.1	24.4	11.9
210	1,120	16.6	16.1	8.9
212	528	9.0	7.6	4.0
214	407	16.6	13.9	5.9
215	1,508	14.7	13.0	6.5
218	1,726	18.5	18.3	9.1
Subtotal <sup>2</sup>	6,857	7.5	6.9	3.3
<i>Native Corporation and Other Lands<sup>3</sup></i>				
205	1,938	70.1	60.7	24.9
206	1,108	26.9	26.9	22.8
207	2,777	31.3	30.4	25.6
208	35	26.5	26.5	26.5
219	80	17.2	17.2	10.9
220	448	32.2	31.8	15.3
Subtotal <sup>4</sup>	6,386	31.5	29.9	18.5
Total <sup>5</sup>	13,243	11.9	11.0	5.5

SOURCE: Tongass Land Management Plan aerial photo points database, Chatham Area Supervisor's Office, Sitka, AK.

<sup>1</sup> No Forest Service harvest is proposed in the SEIS for VCUs 203-208, 211, 213, 216, 217, 219, 220, and 221 on National Forest land.

<sup>2</sup> These values include all National Forest land in the analysis area.

<sup>3</sup> No harvest on Native Corporation or other lands is expected during the SEIS time frame; data represents past cumulative harvest on these lands.

<sup>4</sup> These values include all Native Corporation land in the analysis area.

<sup>5</sup> These values include all National Forest and Native Corporation land in the analysis area.

## 4 Environmental Consequences

Table 4-4

### Effects of Harvest on VCU Land Area, CFL, and Operable CFL for Alternative 3

VCU <sup>1</sup>	Cumulative Harvest (acres)	Percent Operable CFL	Percent CFL	Percent Land
<i>National Forest Land</i>				
203	740	20.5	19.9	6.8
204	1,576	16.2	13.8	5.6
208	159	8.4	7.9	2.5
209	1,948	34.9	30.3	14.8
210	1,498	22.2	21.6	11.9
212	1,500	25.6	21.6	11.3
215	1,747	17.1	15.1	7.5
216	487	13.0	12.3	4.5
217	1,390	22.9	21.4	13.6
218	2,371	25.4	25.1	12.5
219	337	8.9	8.9	5.6
Subtotal <sup>2</sup>	13,753	15.1	13.8	6.6
<i>Native Corporation and Other Lands<sup>3</sup></i>				
205	1,938	70.1	60.7	24.9
206	1,108	26.9	26.9	22.8
207	2,777	31.3	30.4	25.6
208	35	26.5	26.5	26.5
219	80	17.2	17.2	10.9
220	448	32.2	31.8	15.3
Subtotal <sup>4</sup>	6,386	31.5	29.9	18.5
Total <sup>5</sup>	20,139	18.1	16.7	8.3

SOURCE: Tongass Land Management Plan aerial photo points database, Chatham Area Supervisor's Office, Sitka, AK.

<sup>1</sup> No Forest Service harvest is proposed in the SEIS for VCUs 205-207, 211, 213, 214, 220, and 221 on National Forest land.

<sup>2</sup> These values include all National Forest land in the analysis area.

<sup>3</sup> No harvest on Native Corporation or other lands is expected during the SEIS time frame; data represents past cumulative harvest on these lands.

<sup>4</sup> These values include all Native Corporation land in the analysis area.

<sup>5</sup> These values include all National Forest and Native Corporation land in the analysis area.

Table 4-5

**Effects of Harvest on VCU Land Area, CFL, and Operable CFL for Alternative 4**

VCU <sup>1</sup>	Cumulative Harvest (acres)	Percent Operable CFL	Percent CFL	Percent Land
<i>National Forest Land</i>				
204	453	4.7	4.0	1.6
208	90	4.7	4.5	1.4
209	2,038	36.5	31.7	15.4
210	1,702	25.2	24.5	13.5
211	246	9.4	8.3	5.2
212	1,239	21.2	17.9	9.3
213	334	11.8	11.8	8.7
214	547	22.3	18.6	8.0
215	2,133	20.8	18.4	9.2
217	1,390	22.9	21.4	13.6
218	2,539	27.2	26.9	13.4
219	422	11.1	11.1	7.1
<b>Subtotal<sup>2</sup></b>	<b>13,133</b>	<b>14.4</b>	<b>13.2</b>	<b>6.3</b>
<i>Native Corporation and Other Lands<sup>3</sup></i>				
205	1,938	70.1	60.7	24.9
206	1,108	26.9	26.9	22.8
207	2,777	31.3	30.4	25.6
208	35	26.5	26.5	26.5
219	80	17.2	17.2	10.9
220	448	32.2	31.8	15.3
<b>Subtotal<sup>4</sup></b>	<b>6,386</b>	<b>31.5</b>	<b>29.9</b>	<b>18.5</b>
<b>Total<sup>5</sup></b>	<b>19,519</b>	<b>17.5</b>	<b>16.1</b>	<b>8.1</b>

SOURCE: Tongass Land Management Plan aerial photo points database, Chatham Area Supervisor's Office, Sitka, AK.

<sup>1</sup> No Forest Service harvest is proposed in the SEIS for VCUs 203, 205-207, 216, 220, and 221 on National Forest land.

<sup>2</sup> These values include all National Forest land in the analysis area.

<sup>3</sup> No harvest on Native Corporation or other lands is expected during the SEIS time frame; data represents past cumulative harvest on these lands.

<sup>4</sup> These values include all Native Corporation land in the analysis area.

<sup>5</sup> These values include all National Forest and Native Corporation land in the analysis area.

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Table 4-6

## Effects of Harvest on VCU Land Area, CFL, and Operable CFL for Alternative 5

VCU <sup>1</sup>	Cumulative Harvest (acres)	Percent Operable CFL	Percent CFL	Percent Land
<i>National Forest Land</i>				
204	1,240	12.8	10.8	4.4
208	90	4.7	4.5	1.4
209	2,038	36.5	31.7	15.4
210	1,550	23.0	22.3	12.3
212	1,239	21.2	17.9	9.3
213	334	11.8	11.8	8.7
214	547	22.3	18.6	8.0
215	2,070	20.2	17.9	8.9
217	1,317	21.7	20.3	12.9
218	2,238	24.0	23.7	11.8
219	422	11.1	11.1	7.1
Subtotal <sup>2</sup>	13,085	14.4	13.1	6.3
<i>Native Corporation and Other Lands<sup>3</sup></i>				
205	1,938	70.1	60.7	24.9
206	1,108	26.9	26.9	22.8
207	2,777	31.3	30.4	25.6
208	35	26.5	26.5	26.5
219	80	17.2	17.2	10.9
220	448	32.2	31.8	15.3
Subtotal <sup>4</sup>	6,386	31.5	29.9	18.5
Total <sup>5</sup>	19,471	17.5	16.1	8.1

SOURCE: Tongass Land Management Plan aerial photo points database, Chatham Area Supervisor's Office, Sitka, AK.

<sup>1</sup> No Forest Service harvest is proposed in the SEIS for VCUs 203, 205-207, 211, 216, 220, and 221 on National Forest land.

<sup>2</sup> These values include all National Forest land in the analysis area.

<sup>3</sup> No harvest on Native Corporation or other lands is expected during the SEIS time frame; data represents past cumulative harvest on these lands.

<sup>4</sup> These values include all Native Corporation land in the analysis area.

<sup>5</sup> These values include all National Forest and Native Corporation land in the analysis area.

**Table 4-7**  
**Effects of Harvest on VCU Land Area, CFL, and Operable CFL**  
**for Alternative 6**

VCU <sup>1</sup>	Cumulative Harvest (acres)	Percent Operable CFL	Percent CFL	Percent Land
<i>National Forest Land</i>				
208	90	4.7	4.5	1.4
209	1,857	33.3	28.8	14.1
210	1,522	22.6	21.9	12.1
211	87	3.3	2.9	1.9
212	1,139	19.5	16.4	8.6
213	369	13.0	13.0	9.6
214	547	22.3	18.6	8.0
215	1,747	17.1	15.1	7.5
217	1,330	21.9	20.5	13.0
218	1,824	19.6	19.3	9.6
219	452	11.9	11.9	7.6
Subtotal <sup>2</sup>	10,964	12.1	11.0	5.3
<i>Native Corporation and Other Lands<sup>3</sup></i>				
205	1,938	70.1	60.7	24.9
206	1,108	26.9	26.9	22.8
207	2,777	31.3	30.4	25.6
208	35	26.5	26.5	26.5
219	80	17.2	17.2	10.9
220	448	32.2	31.8	15.3
Subtotal <sup>4</sup>	6,386	31.5	29.9	18.5
Total <sup>5</sup>	17,350	15.6	14.4	7.2

SOURCE: Tongass Land Management Plan aerial photo points database, Chatham Area Supervisor's Office, Sitka, AK.

<sup>1</sup> No Forest Service harvest is proposed in the SEIS for VCUs 203-207, 216, 220, and 221 on National Forest land.

<sup>2</sup> These values include all National Forest land in the analysis area.

<sup>3</sup> No harvest on Native Corporation or other lands is expected during the SEIS time frame; data represents past cumulative harvest on these lands.

<sup>4</sup> These values include all Native Corporation land in the analysis area.

<sup>5</sup> These values include all National Forest and Native Corporation land in the analysis area.

## 4 Environmental Consequences

Table 4-8  
Proposed Timber Harvest by Site Class (Acres)

VCU	<i>Low</i>	Site Class <sup>1</sup>	
		<i>Medium</i>	<i>High</i>
<i>Alternative 1</i>			
204	0	0	21
210	0	0	82
212	0	34	827
213	0	0	117
214	21	42	233
215	0	0	65
217	0	0	56
218	0	20	0
219	0	0	91
Total	21	96	1,492
<i>Alternative 2</i>			
212	0	34	264
214	0	0	178
Total	0	34	442
<i>Alternative 3</i>			
203	0	49	676
204	65	337	683
208	22	36	28
209	17	39	28
210	0	146	150
212	0	110	219
217	0	60	73
218	63	133	351
Total	167	910	2,208
<i>Alternative 4</i>			
209	93	88	0
210	115	205	180
211	80	60	106
212	0	100	0
213	0	48	105
215	0	258	151
217	0	60	73
218	144	182	389
219	0	85	0
Total	432	1,086	1,004

(Continued)

Table 4-8 (Continued)

**Proposed Timber Harvest by Site Class (Acres)**

VCU	<i>Low</i>	Site Class <sup>1</sup>	
		<i>Medium</i>	<i>High</i>
<i>Alternative 5</i>			
204	0	425	330
209	93	88	0
210	45	123	180
212	0	100	0
213	0	48	105
215	0	258	65
217	0	60	0
218	63	49	302
219	0	85	0
Total	201	1,236	982
<i>Alternative 6</i>			
204	0	177	517
210	0	55	265
211	0	0	87
213	0	100	88
217	0	0	73
219	0	0	115
Total	0	332	1,145

SOURCE: SEIS Planning Record.

<sup>1</sup> Site Index: Low = Avg. tree height 50-70 feet at 100 years; Medium = Avg. tree height 70-89 feet at 100 years;  
Low = Avg. tree height 90+ feet at 100 years.

# 4 Environmental Consequences

## Timber

The following section focuses on National Forest lands and the proposed harvest activities on those lands. The action alternatives, which propose timber harvest and road construction, could affect the productivity of the land for further timber production. Like the impacts of the alternatives on vegetation, the extent of the impact on timber production is proportional to the amount of land disturbed. The magnitude of the disturbance, however, may be affected by the logging methods and silvicultural prescriptions proposed. Because of the stringent standards and guidelines applied to timber management activities in the Tongass National Forest, the magnitude of the effects of the action alternatives is considered minor.

Section 4, pages 4-1 through 4-12 of the “1986-90 Operating Period for the Alaska Pulp Corporation Long-Term Sale Area FEIS” (1986-90 FEIS) (Forest Service 1986b) has a detailed discussion about the environmental consequences on commercial forest land resulting from the removal of stands of timber from the APC Contract area. This section supplements that section of the 1986-90 FEIS. Below is a summary of the cumulative acreage and percent of CFL acreage and operable CFL acreage that would result under each alternative. Following are discussions of the effects of timber harvest methods, regeneration, and precommercial thinning on the productivity of commercial forest land. The effects of timber harvest on mature and overmature stands is considered long term and is discussed below under reasonably foreseeable, long-term, and cumulative effects.

### *Two Hundred Year-old Spruce and Hemlock Forest*

Proposed harvest would range between 2,704 acres with Alternative 2 to 7,922 acres with Alternative 3. As shown in Tables 4-2 through 4-7, under these alternatives, the percent of operable CFL and total CFL harvested on National Forest land would be 7.5 percent and 6.9 per-



cent for Alternative 2 and 15.1 percent and 13.8 percent for Alternative 3. The remaining alternatives fall between this range. Although this land would be affected by the alternatives, the forestry practices described below would be employed to maintain the productivity for timber on these lands.

Yarding is the process of conveying logs with a cable logging system to a landing. A standard and common method is the highlead cable system. This system is capable of yarding up to 1,200 feet slope distance. Skyline logging includes several yarding techniques. The Grabinski system is a modification of highlead in common use in the Chatham Area. This system can reach distances approaching 2,000 feet. Long-span skylines are used on large tower yarders and can yard spans between 2,000 and 3,000 feet. The previous systems are normally used on tower yarders. Another skyline method called running skyline is used on small mobile yarders. Running skylines have distance capability of up to 1,600 feet.

Moist and soft soils in the Chatham Area are difficult for operation of ground-based equipment and there has been little opportunity for use of these machines except for shovel logging with track-mounted log loaders. Shovel logging is the process of moving logs with the boom of a hydraulic log loader. The object is to use the swing motion of the loader to swing logs into windrows, then swing the windrows to new locations.

The different logging systems used in the Chatham Area have different effects on the ground. The logs yarded by the highlead system are generally dragged on the ground. Some lift to one end of the log is provided by the 90-foot towers commonly used with this method. Where highlead is done uphill to the landing, the drag corridors diverge down away from the landing. Water moving down the slope is dispersed into the cut unit. Where highlead is done down slope to the landing, water tends to congregate at the landing.

During yarding, skyline logging methods and the Grabinski system are able to lift one end of the logs or completely suspend the log. Impact of log movement with these systems is reduced when compared to highlead. Convergence or divergence of drag corridors, as discussed with the highlead system, are similar except the skyline skid corridors are not as deep.

The effect of shovel logging is compaction of the soil under the track system. The impact on the soil depends on the soil type and moisture condition. Shovel logging results in problems in poorly drained soils or soils with organic parent materials, however, it will impact the soil less than cable methods where the cable system is prone to rutting by log passage. Since by shovel logging, logs are lifted slowly, picked up, and laid down again; no rutting occurs. Where the machine moves over slash or deep organic accumulations, compaction may not be a factor.

Tables 2-3, 2-4, 2-6, 2-8, 2-10, and 2-12 provide data on the distribution of proposed yarding systems for the alternative being analyzed. Highlead is the proposed system for 56 to 100 percent of the acres in the alternatives and 0 to 44 percent of the acres are proposed for short/intermediate-span skyline systems. Other harvest methods, including long-span skyline systems or helicopter logging, are not planned under any of the alternatives.

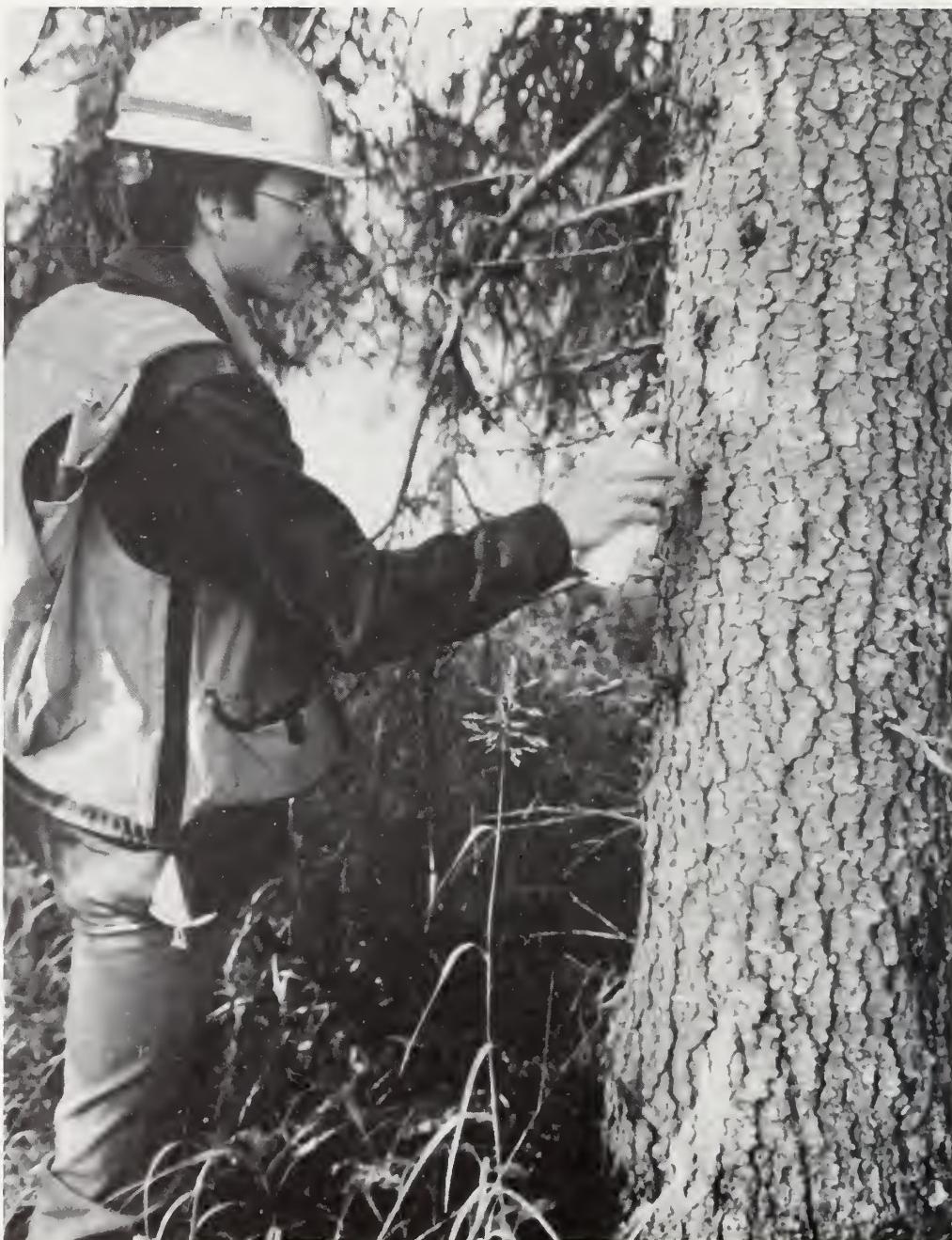
The Forest Service is required by law, regulation, and policy to plan harvest of timber only where there is assurance that such land can be regenerated within five years after harvest is completed. Current management prescriptions for harvest units in Analysis Area 3 specify natural regeneration to restock most clearcut-harvested stands. Artificial regeneration by hand planting would serve as the back-up method for stands that cannot be certified as adequately regenerated within five years. Burning may be used to prepare sites for natural regeneration establishment. Some areas may also be broadcast burned if management direction and silvicultural prescriptions indicate a need to reduce fuel concentrations. Burning also shows some promise as a measure to improve the wildlife habitat of a second-growth stand where logging debris is an impediment.

## 4 Environmental Consequences

In Southeast Alaska, 50 years of experience has demonstrated clearcutting to be successful and the most cost-effective method of facilitating natural regeneration of commercial forest species. Although the term clearcut appears to contradict the regeneration concept, this is not the case in the Southeast Alaska spruce/hemlock forest ecosystem where clearcutting results in prolific tree production. Tree production in such exposed areas can be so thick that pre-commercial thinning is required to reduce stand stocking levels to less than 200 stems per acre. Shallow soils and severe weather conditions have resulted in windthrow where selection and shelterwood harvest systems have been attempted.

Precommercial thinning would be prescribed in some areas under all of the action alternatives. There are many advantages to reducing natural conifer stocking levels from 3,000 trees per acre by precommercial thinning. Short-term benefits include employment and increased,

*Timber Cruiser Determines the Volume of a Timber Stand*



higher quality habitat for some wildlife species than would be provided in unthinned second-growth stands. Long-term benefits are primarily centered around reducing the competition for sunlight by the plant community. This results in the understory and the remaining conifers growing at accelerated rates for longer time periods than unthinned second-growth stands. This translates into higher forage values to wildlife, higher sawlog volume, and faster successional change, thus providing climax stand conditions sooner than would be provided by unthinned second-growth stands.

## Wildlife

Information from the Affected Environment section (Chapter 3) provides the basis to evaluate impacts on the various wildlife species and habitats. The analysis of impacts focuses on the emphasis species and emphasis habitats discussed in Chapter 3. The analysis provided below considers the alternatives along with general and site-specific differences and similarities among them. It also considers both the impacts of the alternatives and the combined impacts of all past timber harvest in Analysis Area 3. Effects on wildlife habitats are discussed first, followed by a discussion of the effects on the wildlife species.

### Wildlife Habitats

Timber harvest activities proposed by the action alternatives on National Forest land would generally result in the loss of existing wildlife habitat values. In those affected habitats, most or all immobile species and life stages, or species with small home ranges could be directly lost. Resident and migratory species dependent upon those habitats would be forced to relocate to adjacent areas. Those displaced animals would increase the competition for food and cover in the remaining habitats. Where the population of a wildlife species is near the carrying capacity of the habitat, the population would be reduced to the number the remaining habitat could support or to a lower number if the increased competition caused degradation of the habitat.

The action alternatives (3 through 6) being analyzed for the National Forest lands would include harvest of some additional wildlife habitat. The location of the impacts shifts somewhat around the Analysis Area among the alternatives. Alternatives 3 through 6 also include the effects shown for Alternative 1.

The information presented in the tables is a summary of the data available on the Unit Cards which are reproduced in Appendix A-1. The Unit Cards list the acres of specific habitat type that would be affected by that harvest unit and associated roads. The unit numbers can be located on the Alternative Maps included in this SEIS to determine the specific locations within the VCUs where the effects would occur. The GIS data base, which is included in the Planning Record, contains digital maps of the various wildlife habitat types as well as the proposed harvest units and roads.

Acres of forested habitat that would be altered by harvest in each alternative are presented in Table 4-9. The amount varies from 0 to 1,239 acres in separate VCUs. Forested habitat includes all acres of commercial forest land. The other emphasis habitats are also included within the larger category of forested habitat. For the forested habitat, the percent remaining on National Forest lands at the end of the timber harvest proposed and approved through December 31, 1990 would range from 83 percent in VCU 209 for Alternative 1 to 100 percent in three VCUs for all alternatives (Table 4-10).

The changes in emphasis habitats on National Forest land for each alternative are discussed below. The data on acres affected and acres remaining are derived from planning records for the Tongass Land Management Plan (TLMP), the 1986-90 FEIS, and ongoing planning records in the Chatham Area Office. The tables that show acres of wildlife habitats remaining account for all timber harvest authorized or proposed through December 31, 1990.

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Table 4-9  
Forested Habitat Affected by Alternative<sup>1</sup>

VCU	1	2	3	4	5	6
<i>Acres Affected</i>						
203	0	0	740	0	0	0
204	21	0	1,239	0	787	694
208	33	0	69	0	0	0
209	553	218	80	181	181	0
210	1,202	859	288	500	348	320
211	0	0	0	246	0	87
212	1,139	528	360	100	100	0
213	181	0	0	153	153	188
214	547	407	0	0	0	0
215	449	210	0	386	323	0
217	56	0	133	133	0	73
218	273	175	547	715	414	0
219	91	0	0	85	85	115
Total	4,545	2,397	3,456	2,499	2,391	1,477
<i>Percent Affected</i>						
203	0	0	8	0	0	0
204	— <sup>2</sup>	0	5	0	3	3
208	1	0	1	0	0	0
209	5	2	1	2	2	0
210	11	8	3	5	3	3
211	0	0	0	6	0	2
212	12	5	4	1	1	0
213	6	0	0	5	5	6
214	14	11	0	0	0	0
215	2	1	0	2	2	0
217	1	0	2	2	0	1
218	2	1	4	5	3	0
219	2	0	0	2	2	2
Total <sup>3</sup>	3	2	2	2	2	1

SOURCE: SEIS Planning Record.

<sup>1</sup> National Forest land.

<sup>2</sup> This value is less than 0.5 percent.

<sup>3</sup> This value represents the percent of pre-harvest habitat affected in the entire analysis area.

Table 4-10

Forested Habitat Remaining by Alternative<sup>1</sup>

VCU	1	2	3	4	5	6
<i>Acres Remaining</i>						
203	8,756	8,756	8,031	8,756	8,756	8,756
204	25,177	25,198	24,092	25,198	24,422	24,483
205	3,401	3,401	3,401	3,401	3,401	3,401
207	8,057	8,057	8,057	8,057	8,057	8,057
208	5,487	5,520	5,401	5,487	5,487	5,487
209	9,088	9,423	9,004	8,907	8,907	9,088
210	8,801	9,144	8,505	8,301	8,453	8,481
211	4,002	4,002	4,002	3,756	4,002	3,915
212	8,615	9,226	8,286	8,515	8,515	8,615
213	2,785	2,966	2,785	2,617	2,617	2,597
214	3,271	3,411	3,271	3,271	3,271	3,271
215	16,923	17,162	16,923	16,514	16,923	16,923
216	6,309	6,309	6,309	6,309	6,309	6,309
217	7,557	7,613	7,424	7,424	7,497	7,484
218	13,014	13,114	12,467	12,299	12,600	13,014
219	4,608	4,699	4,608	4,523	4,523	4,493
220	10,953	10,953	10,953	10,953	10,953	10,953
221	3,696	3,696	3,696	3,696	3,696	3,696
Total	150,500	152,650	147,215	147,984	148,389	149,023
<i>Percent Remaining</i>						
203	98	98	90	98	98	98
204	98	98	94	98	95	96
205	100	100	100	100	100	100
207	100	100	100	100	100	100
208	99	99	97	99	99	99
209	83	86	82	81	81	83
210	89	86	80	78	79	80
211	100	100	100	94	100	98
212	88	95	85	85	87	88
213	94	100	94	88	88	88
214	86	89	86	86	86	86
215	91	92	91	88	91	91
216	93	93	93	93	93	93
217	86	86	84	84	85	85
218	86	87	83	82	84	86
219	93	95	93	91	91	91
220	93	93	93	93	93	93
221	94	94	94	94	94	94
Total <sup>2</sup>	92	94	93	94	94	94

SOURCE: SEIS Planning Record.

<sup>1</sup> National Forest land.<sup>2</sup> This value represents the percent of pre-harvest habitat remaining in the entire analysis area.

## 4 Environmental Consequences



### Deer Winter Range

Acres of deer winter range that would be harvested by each alternative are presented in Table 4-11. The amount ranges from 0 in many VCUs to 200 acres in VCU 212 with Alternative 3. The percent reduction within a given VCU ranges from 0 to 26 percent with the different alternatives.

Deer winter range remaining following timber harvest (Table 4-12) would range from 100 percent for the alternatives in one VCU to 80 percent for all the alternatives in VCU 203. The amount of winter range remaining would be similar for all alternatives and ranges between approximately 14,500 acres and 14,900 acres. The capability of this habitat to produce deer is discussed later in this section, under Emphasis Species.

Table 4-11

### Deer Winter Range Habitat Affected by Alternative<sup>1</sup>

VCU	1	2	3	4	5	6
<i>Acres Affected</i>						
209	0	0	41	50	50	0
210	82	0	15	70	0	85
211	0	0	0	0	0	93
212	0	0	200	0	0	0
213	25	0	0	48	48	188
214	27	0	0	0	0	0
215	83	60	0	0	0	0
217	0	0	0	42	0	0
218	27	27	0	0	0	0
219	91	0	0	0	0	60
Total	335	87	256	210	98	426
<i>Percent Affected</i>						
209	0	0	3	4	4	0
210	4	0	1	4	0	4
211	0	0	0	0	0	12
212	0	0	26	0	0	0
213	2	0	0	3	3	13
214	11	0	0	0	0	0
215	3	2	0	0	0	0
217	0	0	0	3	0	0
218	2	2	0	0	0	0
219	8	0	0	0	0	5
Total <sup>2</sup>	2	1	2	1	1	3

SOURCE: SEIS Planning Record.

<sup>1</sup> National Forest land.

<sup>2</sup> This value represents the percent of pre-harvest habitat affected in the entire analysis area.

Table 4-12

Dear Winter Range Habitat Remaining by Alternative<sup>1</sup>

VCU	1	2	3	4	5	6
<i>Acres Remaining</i>						
203	565	565	565	565	565	565
204	940	940	940	940	940	940
205	— <sup>2</sup>					
207	— <sup>2</sup>					
208	638	638	638	638	638	638
209	1,048	1,048	1,007	998	998	1,048
210	1,880	1,962	1,865	1,810	1,962	1,795
211	748	748	748	748	748	655
212	768	768	568	768	768	768
213	1,284	1,309	1,284	1,236	1,236	1,096
214	229	256	229	229	229	229
215	2,134	2,157	2,134	2,134	2,134	2,134
216	— <sup>2</sup>					
217	1,254	1,254	1,254	1,212	1,254	1,254
218	1,114	1,114	1,114	1,114	1,114	1,114
219	962	1,053	962	962	962	902
220	— <sup>2</sup>					
221	1,060	1,060	1,060	1,060	1,060	1,060
Total	14,624	14,872	14,368	14,414	14,608	14,198
<i>Percent Remaining</i>						
203	80	80	80	80	80	80
204	86	86	86	86	86	86
205	— <sup>2</sup>					
207	— <sup>2</sup>					
208	100	100	100	100	100	100
209	85	85	82	81	81	85
210	96	100	95	92	100	91
211	100	100	100	100	100	88
212	100	100	74	100	100	100
213	91	93	91	88	88	78
214	89	100	89	89	89	89
215	81	82	81	81	81	81
216	— <sup>2</sup>					
217	91	91	91	88	91	91
218	84	84	84	84	84	84
219	86	95	86	86	86	81
220	— <sup>2</sup>					
221	91	91	91	91	91	91
Total <sup>3</sup>	89	91	87	88	89	86

SOURCE: SEIS Planning Record.

<sup>1</sup> National Forest land.<sup>2</sup> None of this habitat was found in the inventory.<sup>3</sup> This value represents the percent of pre-harvest habitat remaining in the entire analysis area.

## 4 Environmental Consequences

### Inland Wetland

None of these habitats would be altered by harvest in any of the current alternatives. The percent of inland wetland habitat remaining would range from 81 percent in VCU 218 to 100 percent in six VCUs. There are no differences between the alternatives as none propose to alter inland wetland habitat.

### Beach Fringe

Acres of beach fringe habitat that would be altered by harvest in each alternative are presented in Table 4-13. The amount affected ranges from 0 acres for most VCUs to 85 acres in VCU 211 with Alternative 6. No beach fringe habitat would be altered by harvest with Alternatives 4 and 5. The percent of original beach fringe habitat remaining would range from 55 percent for all the alternatives in VCU 209 to 100 percent for three of the VCUs (Table 4-14).

### Estuarine Fringe

None of these habitats would be altered by harvest in any of the current alternatives. The percent of original estuarine fringe habitat remaining would range from 94 percent in VCU 217 to 100 percent in five VCUs. There are no differences between the alternatives as none propose to alter estuarine fringe habitat.

Table 4-13  
**Beach Fringe Habitat Affected by Alternative<sup>1</sup>**

VCU	1	2	3	4	5	6
<i>Acres Affected</i>						
210	10	0	0	0	0	42
211	0	0	0	0	0	85
212	0	0	23	0	0	0
213	0	0	0	0	0	42
215	33	20	0	0	0	0
219	46	0	0	0	0	64
Total	89	20	23	0	0	233
<i>Percent Affected</i>						
210	2	0	0	0	0	6
211	0	0	0	0	0	15
212	0	0	9	0	0	0
213	0	0	0	0	0	4
215	4	2	0	0	0	0
219	11	0	0	0	0	15
Total <sup>2</sup>	1	— <sup>3</sup>	— <sup>3</sup>	0	0	3

SOURCE: SEIS Planning Record.

<sup>1</sup> National Forest land.

<sup>2</sup> This value represents the percent of pre-harvest habitat affected in the entire analysis area.

<sup>3</sup> This value is less than 0.5 percent.

Table 4-14

Beach Fringe Habitat Remaining by Alternative<sup>1</sup>

VCU	1	2	3	4	5	6
<i>Acres Remaining</i>						
203	211	211	211	211	211	211
204	594	594	594	594	594	594
205	— <sup>2</sup>					
207	— <sup>2</sup>					
208	502	502	502	502	502	502
209	255	255	255	255	255	255
210	659	669	659	659	659	659
211	560	560	560	560	560	475
212	255	255	232	255	255	255
213	1,086	1,086	1,086	1,086	1,086	1,044
214	109	109	109	109	109	109
215	780	793	780	780	780	780
216	— <sup>2</sup>					
217	479	479	479	479	479	479
218	560	560	560	560	560	560
219	348	394	348	348	348	284
220	— <sup>2</sup>					
221	615	615	615	615	615	615
Total	7,013	7,082	6,990	7,013	7,013	6,822
<i>Percent Remaining</i>						
203	71	71	71	71	71	71
204	88	88	88	88	88	88
205	— <sup>2</sup>					
207	— <sup>2</sup>					
208	100	100	100	100	100	100
209	55	55	55	55	55	55
210	99	100	99	99	99	99
211	100	100	100	100	100	85
212	100	100	91	100	100	100
213	99	99	99	99	99	95
214	100	100	100	100	100	100
215	93	95	93	93	93	93
216	— <sup>2</sup>					
217	99	99	99	99	99	99
218	100	100	100	100	100	100
219	83	94	83	83	83	68
220	— <sup>2</sup>					
221	92	92	92	92	92	92
Total <sup>3</sup>	92	93	92	92	92	90

SOURCE: SEIS Planning Record.

<sup>1</sup> National Forest land.<sup>2</sup> None of this habitat was found in the inventory.<sup>3</sup> This value represents the percent of pre-harvest habitat remaining in the entire analysis area.

## 4 Environmental Consequences

*Inland Wetland Habitat is Important to Many Species of Wildlife*

### Streamside Riparian

Acres of streamside riparian habitat that would be altered by harvest for each alternative are shown in Table 4-15. The amount ranges from 0 acres in many VCUs to 69 acres in VCU 212. The affected amount ranges from less than 1 percent in VCU 209 to 47 percent in VCU 214.

The percent of original streamside riparian habitat remaining would range from 42 percent for Alternative 1 in VCU 219 to 100 percent in two VCUs (Table 4-16). The amount remaining would be similar for all the alternatives and range between approximately 7,500 acres and 7,700 acres.

### Old-Growth Conditions

The 1986-90 FEIS identified some forest areas that were prescribed as old-growth habitat conditions. Table 4-17 shows the amount of prescribed old-growth habitat conditions and the proposed timber harvest alternatives. Alternative 6 would have the greatest effect on prescribed old-growth conditions. Approximately 550 acres are proposed for timber harvest under this alternative. (Refer to the Alternative Maps for old growth prescriptions continuing through the balance of the Operating Period.)



It is important to note that if all proposed timber harvest in any action alternative were implemented, approximately 96 percent of the existing prescribed old-growth habitat conditions would still remain. Additional habitat of equivalent quality also exists in areas where no old-growth conditions were prescribed. The 1986-90 FEIS did not evaluate all of the VCUs within Analysis Area 3 for purposes of prescribing old-growth habitat conditions. VCUs 205, 207, 216, 220, and 221 as shown on the 1986-90 maps, contain no such prescription.

Table 4-15

**Streamside Riparian Habitat Affected by Alternative<sup>1</sup>**

VCU	1	2	3	4	5	6
<i>Acres Affected</i>						
204	0	0	0	0	13	37
209	0	7	2	3	0	0
210	52	40	6	0	0	0
212	69	20	2	0	0	0
213	5	0	0	0	0	0
214	37	26	0	0	0	0
215	11	5	0	0	0	0
217	1	0	0	0	0	0
219	4	0	0	0	0	0
Total	179	98	10	3	13	37
<i>Percent Affected</i>						
204	0	0	0	0	1	2
209	0	1	— <sup>2</sup>	1	0	0
210	7	6	1	0	0	0
212	17	5	1	0	0	0
213	7	0	0	0	0	0
214	47	33	0	0	0	0
215	2	1	0	0	0	0
217	— <sup>2</sup>	0	0	0	0	0
219	8	0	0	0	0	0
Total <sup>3</sup>	2	1	— <sup>2</sup>	— <sup>2</sup>	— <sup>2</sup>	1

SOURCE: SEIS Planning Record.

<sup>1</sup> National Forest land.<sup>2</sup> This value is less than 0.5 percent.<sup>3</sup> This value represents the percent of pre-harvest habitat affected in the entire analysis area.

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Table 4-16  
Streamside Riparian Habitat Remaining by Alternative<sup>1</sup>

VCU	1	2	3	4	5	6
<i>Acres Remaining</i>						
203	311	311	311	311	298	274
204	1,885	1,885	1,885	1,885	1,872	1,848
205	— <sup>2</sup>					
207	300	300	300	300	300	300
208	— <sup>2</sup>					
209	380	380	378	377	380	380
210	650	662	644	650	650	650
211	— <sup>2</sup>					
212	341	390	339	341	341	341
213	37	42	37	37	37	37
214	42	53	42	42	42	42
215	636	642	636	636	636	636
216	— <sup>2</sup>					
217	296	297	296	296	296	296
218	864	864	864	864	864	864
219	21	25	21	21	21	21
220	1,709	1,709	1,709	1,709	1,709	1,709
221	60	60	60	60	60	60
Total	7,532	7,620	7,522	7,529	7,506	7,458
<i>Percent Remaining</i>						
203	100	100	100	100	96	88
204	97	97	97	97	97	97
205	— <sup>2</sup>					
207	100	100	100	100	100	100
208	— <sup>2</sup>					
209	68	68	68	68	68	68
210	92	94	91	92	92	92
211	— <sup>2</sup>					
212	83	95	83	83	83	83
213	49	55	49	49	49	49
214	53	67	53	53	53	53
215	90	91	90	90	90	90
216	— <sup>2</sup>					
217	65	65	65	65	65	65
218	94	94	94	94	94	94
219	42	50	42	42	42	42
220	100	100	100	100	100	100
221	66	66	66	66	66	66
Total <sup>3</sup>	91	92	91	91	90	90

SOURCE: SEIS Planning Record.

<sup>1</sup> National Forest land.

<sup>2</sup> None of this Habitat was found in the inventory.

<sup>3</sup> This value represents the percent of pre-harvest habitat remaining in the entire analysis area.

Table 4-17

**Old-Growth Habitat Affected by Alternative in Acres**

VCU <sup>1</sup>	Old-Growth Conditions <sup>2</sup>	1	2	3	4	5	6
203	604	0	0	0	0	0	0
204	1,209	0	0	0	0	0	0
205	0	0	0	0	0	0	0
207	0	0	0	0	0	0	0
208	442	0	0	0	0	0	0
209	698	0	0	0	0	0	0
210	1,036	0	0	0	70	0	85
211	501	0	0	0	0	0	87
212	744	0	0	0	0	0	0
213	2,438	0	0	0	153	153	188
214	336	0	0	0	0	0	0
215	2,566	0	0	0	0	0	0
216	0	0	0	0	0	0	0
217	1,340	0	0	73	73	0	73
218	1,641	0	0	0	0	0	0
219	791	0	0	0	0	0	115
220	0	0	0	0	0	0	0
221	0	0	0	0	0	0	0
Total	14,346	0	0	73	296	153	548

SOURCE: SEIS Planning Record.

NOTE: See the Alternative Map included with this document.

<sup>1</sup> VCU 206 is wholly owned by Native Corporations.<sup>2</sup> Habitat acres prescribed on National Forest land in the 1986-90 FEIS (Forest Service 1986b).

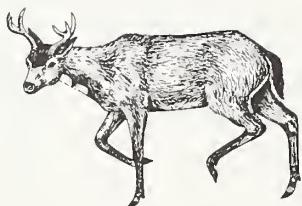
## 4 Environmental Consequences

*Wildlife Habitat Prescribed to be Managed in Old Growth Condition*



### Emphasis Species

The changes to wildlife habitats discussed above would have an effect on the wildlife that use those habitats. Emphasis species have been selected to identify those effects and allow some comparison to how the other wildlife may be affected. In addition to a discussion of timber harvest impacts resulting from the alternatives, information is provided below concerning deer and pine marten habitat capability.



*Sitka Black-tailed Deer*

#### Black-tailed Deer

The Sitka black-tailed deer utilizes all habitats within Analysis Area 3. The quality of habitats in close proximity to the shoreline is believed to be the most critical factor limiting survival of the black-tailed deer during severe winters. Timber harvest in this habitat could affect deer population numbers during severe winters, at least until suitable vegetation is re-established.

The proposed timber harvest alternatives would have approximately the same effect on all wildlife habitats. Alternative 6 proposes the harvest of approximately 550 acres of prescribed old-growth habitat. Although this habitat is important to black-tailed deer, the harvest proposed represents 4 percent of the existing prescribed old-growth in the entire Analysis Area. The other alternatives propose harvest between 0 and 296 acres of prescribed old-growth habitat.

A deer habitat capability model was used to estimate potential effects of management activities on deer numbers. The model, which is described in Consolidated Appendix, Volume III, E-1, evaluates factors such as vegetative species, volume class, successional stage, slope, aspect, and elevation as a means of predicting potential effects on deer herds (see Consolidated Appendix, Volume II, C-2, theme response 9 on data adequacy and use of models).

The habitat capability model information indicates that less than a 4 percent reduction in deer numbers may be expected from the proposed timber harvest alternatives (Table 4-18). In Alternative 2, the potential reduction approaches close to 1 percent. This potential reduction represents approximately 80 to 190 animals in a potential existing population of 5,300 (Table 4-19).

Table 4-18

**Projected Percent Reduction of Sitka Black-tailed Deer Habitat Numbers Based on a Habitat Capability Model**

VCU	Previous Change <sup>1</sup>	Alternative					
		1	2	3	4	5	6
<i>Minor Harvest Area 3523</i>							
203	0	0	0	13.8	0	0	0
204	3.8	0	0	6.9	0	4.2	4.4
204 <sup>2</sup>	2.9	0	0	0	0	0	0
205	4.0	0	0	0	0	0	0
205 <sup>2</sup>	7.6	0	0	0	0	0	0
206 <sup>2</sup>	18.2	0	0	0	0	0	0
216	15.4	0	0	0	0	0	0
Subtotal <sup>3</sup>	6.4	0	0	4.3	0	1.6	1.7
<i>Minor Harvest Area 3524</i>							
207	0	0	0	0	0	0	0
207 <sup>2</sup>	21.4	0	0	0	0	0	0
208	0	0.1	0	0.1	0.1	0.1	0.1
208 <sup>2</sup>	0	0	0	0	0	0	0
209	10.4	4.2	4.2	5.6	5.8	5.8	4.2
Subtotal <sup>3</sup>	11.8	1.1	1.0	1.3	1.4	1.4	1.1
<i>Minor Harvest Area 3625</i>							
210	0	11.8	10.8	14.0	14.7	14	14.7
211	0	0	0	0	3.5	0	2.1
212	0	12.5	5.6	16.4	12.9	12.9	12.5
213	0	3.3	0	0	10.8	10.8	9.2
214	0	12.9	9.7	0	12.9	12.9	12.9
215	6.0	1.9	0.9	0	3.8	3.3	1.9
217	12.4	0.3	0	2.4	2.4	1.4	1.4
218	12.3	2.1	1.6	4.6	5.5	3.9	2.1
Subtotal <sup>3</sup>	5.8	4.7	3.0	4.9	7.1	6.2	5.6

(Continued)

## 4 Environmental Consequences

Table 4-18 (Continued)

### Projected Percent Reduction of Sitka Black-tailed Deer Habitat Numbers Based on a Habitat Capability Model

VCU	Previous Change <sup>1</sup>	Alternative					
		1	2	3	4	5	6
<i>Minor Harvest Area 3626</i>							
219	4.3	0.6	0	0	1.9	1.9	1.9
219 <sup>4</sup>	0	0	0	0	0	0	0
220	6.4	0	0	0	0	0	0
220 <sup>4</sup>	0	0	0	0	0	0	0
221	12.8	0	0	0	0	0	0
221 <sup>4</sup>	0	0	0	0	0	0	0
Subtotal <sup>3</sup>	5.8	0.1	0	0	0.4	0.4	0.4
Total <sup>5</sup>	7.1	2.1	1.4	3.3	3.2	3.3	3.0

SOURCE: Forest Service in consultation with ADF&G (SEIS Planning Record). See also Consolidated Appendix, Volume II, C-3, on data adequacy and models used.

<sup>1</sup> Numbers reflect changes in deer habitat capability resulting from previous timber harvest through September 1, 1988.

<sup>2</sup> No timber harvest is projected on Native Corporation land.

<sup>3</sup> This value represents the percent reduction in the entire minor harvest area.

<sup>4</sup> No timber harvest is projected on Private land.

<sup>5</sup> This value represents the percent reduction in the entire analysis area.

Table 4-19

**Projected Reduction of Potential Sitka Black-tailed Deer Numbers Based on a Habitat Capability Model**

VCU	Present Deer Habitat Capability	Alternative				5	6
		1	2	3	4		
<i>Minor Harvest Area 3523</i>							
203	167	0	0	23	0	0	0
204	530	0	0	38	0	23	24
204 <sup>1</sup>	99	0	0	0	0	0	0
205	170	0	0	0	0	0	0
205 <sup>1</sup>	133	0	0	0	0	0	0
206 <sup>1</sup>	166	0	0	0	0	0	0
216	66	0	0	0	0	0	0
Subtotal	1,331	0	0	61	0	23	24
<i>Minor Harvest Area 3524</i>							
207	261	0	0	0	0	0	0
207 <sup>1</sup>	386	0	0	0	0	0	0
208	101	1	0	1	1	1	1
208 <sup>1</sup>	6	0	0	0	0	0	0
209	233	11	11	13	15	15	11
Subtotal	987	12	11	14	16	16	12
<i>Minor Harvest Area 3625</i>							
210	279	33	30	39	41	39	41
211	143	0	0	0	5	0	3
212	287	36	16	47	37	37	36
213	120	4	0	0	13	13	11
214	124	16	12	0	16	16	16
215	549	11	5	0	22	19	11
217	324	1	0	9	9	5	5
218	384	9	7	20	24	17	9
Subtotal	2,210	110	70	115	167	146	132

(Continued)

## 4 Environmental Consequences

Table 4-19 (Continued)

### Projected Reduction of Potential Sitka Black-tailed Deer Numbers Based on a Habitat Capability Model

VCU	Present Deer Habitat Capability	Alternative				5	6
		1	2	3	4		
<i>Minor Harvest Area 3626</i>							
219	154	1	0	0	3	3	3
219 <sup>2</sup>	25	0	0	0	0	0	0
220	409	0	0	0	0	0	0
220 <sup>2</sup>	107	0	0	0	0	0	0
221	95	0	0	0	0	0	0
221 <sup>2</sup>	11	0	0	0	0	0	0
Subtotal	801	1	0	0	3	3	3
Total	5,329	123	81	190	186	188	171

SOURCE: Forest Service in consultation with ADF&G (SEIS Planning Record). See also Consolidated Appendix, Volume II, C-3, on data adequacy and models used.

<sup>1</sup> No timber harvest is projected on Native Corporation land.

<sup>2</sup> No timber harvest is projected on Private land.

The discussion in Chapter 3 indicated ADF&G has produced a document that recommends no greater than 10 percent of the existing deer population should be harvested annually. These guidelines were developed through the use of simulation model, evaluation of deer harvest data and research into the specific habitat needs of the black-tailed deer. As noted in Chapter 3, all five Minor Harvest Areas reported 1988 deer harvest levels above the amount needed to sustain the population. Further evaluation of the data also indicated that current deer harvest levels in these three Minor Harvest Areas exceeded the habitat capability estimates in 1961 prior to any APC timber harvest activities.

Timber harvest proposed in Minor Harvest Areas 3523, 3525, 3531, and 3626 is projected to result in additional deer number reductions. Alternative 3 proposes timber harvest that would result in additional habitat capability losses on National Forest land and is projected to include 68 deer in Minor Harvest Area 3523, 70 deer in Minor Harvest Area 3525, and 181 deer in Minor Harvest Area 3531. No further timber harvest is expected on Native Corporation or private lands through 1990.



Brown Bear

#### Brown Bear

As discussed in Chapter 3 of this document, brown bear harvest data in Analysis Area 3 reflects a general increase in road access, timber harvest, and population growth within the permanent communities. These factors and particularly the increased road density, have had a direct effect on brown bear population numbers. The local road access and increased human population has combined with the ability of adjacent communities to access the area by roads or the marine highway system ferry to put a substantial amount of harvest pressure on the brown bear.

The brown bear utilizes forested, beach fringe, and streamside riparian habitats within Analysis Area 3. Proposed timber harvest activities on National Forest land would affect approximately 2 percent of the forested habitat and less than 1 percent of the beach fringe and streamside riparian habitats. The greatest impacts to the forested habitat would occur in Alternative 3, to beach fringe in Alternative 6, and to streamside riparian in Alternative 2.

The brown bear model used to estimate habitat capability numbers considers human population numbers and their proximity to the habitat, the method of garbage disposal (open garbage dumps or incineration), habitat effects due to timber harvest, and road density. Of all the factors considered, road density (both existing and new construction) and access to brown bear habitat has the greatest potential for reducing bear numbers. This is due to the improved access for hunters and the incidental human-bear contact which sometimes results in "defense of life or property" kills. (See Consolidated Appendix, Volume II, C-3, theme response 9 on data adequacy and models used.)

The habitat capability model information projects that less than a 6 percent reduction in brown bear numbers may be expected from the proposed timber harvest alternatives (Table 4-20). In Alternative 2, the potential reduction is estimated to be close to 2 percent. This potential reduction represents approximately 6 to 14 animals in a potential population of 140 (Table 4-21).

As part of the timber harvest described in the alternatives, the Forest Service is considering several road management options to protect the brown bear and its habitat. These options, as described below in the Mitigation section, include the administrative closure of various roads throughout Analysis Area 3. The immediate effect on the brown bear would occur primarily where there is proposed new construction. Since these areas have not been previously entered, controlled access would maintain limited human-bear encounters. The habitat capability model predicts that four fewer bears would be killed if the new roads proposed in VCUs 203, 204, and 212 were closed to public access.

The road closure management proposals also include existing roads throughout the analysis area. In areas where an extensive road network already exists, the improvement of bear population numbers due to road closure management would be realized further into the future. Long-term effects to the brown bear population are discussed in the Cumulative Effects section. In addition, an illustration in that section compares the long-term effects on population numbers with and without the road closure options.



#### Pine Marten

The pine marten utilizes forested old-growth, beach fringe, and streamside riparian habitats within Analysis Area 3. Proposed timber harvest activities on National Forest land would affect approximately 2 percent of the forested habitat, 4 percent of the prescribed old-growth, and less than 1 percent of the beach fringe and streamside riparian habitats. The greatest impacts to the forested habitat would occur in Alternative 3, to beach fringe in Alternative 6, and to streamside riparian in Alternative 2. The pine marten habitat capability model is available for public review in the Planning Record. The model evaluates timber stand ages, volume classes, roads, and elevation. The model is used to estimate the effects on potential carrying capacity of marten by harvest alternative. (See Consolidated Appendix, Volume II, C-3, theme response 9 on data adequacy and models used.)

The habitat capability model information projects that less than a 4 percent reduction in pine marten numbers (without the proposed road management options) may be expected from the proposed timber harvest alternatives (Table 4-22). In Alternative 6, the potential reduction approaches 1 percent. This potential reduction represents approximately 10 to 20 animals in a potential population of 560 (Table 4-23).

#### Land Otter

Land otters generally occur close to the beach, using beach fringe and streamside riparian habitats. The proposed harvest alternatives would have little effect on either of these habitats. The proposed alternatives would leave over 90 percent of the beach fringe and streamside riparian habitats.

## 4 Environmental Consequences

Table 4-20

### Projected Percent Reduction of Potential Brown Bear Numbers Based on a Habitat Capability Model

VCU	Previous Change <sup>1</sup>	Alternative					
		1	2	3	4	5	6
<i>Minor Harvest Area 3523</i>							
203	8.3	0	0	33.3	0	0	0
204	44.8	3.4	0	17.2	0	13.8	10.3
204 <sup>2</sup>	57.1	0	0	0	0	0	0
205	50.0	0	0	0	0	0	0
205 <sup>2</sup>	77.8	0	0	0	0	0	0
206 <sup>2</sup>	100.0	0	0	0	0	0	0
216	50.0	0	0	0	0	0	0
Subtotal <sup>3</sup>	50.0	1.3	0	11.5	0	5.1	3.8
<i>Minor Harvest Area 3524</i>							
207	0	0	0	0	0	0	0
207 <sup>2</sup>	76.5	0	0	0	0	0	0
208	42.9	0	0	0	0	0	0
209	60.0	0	0	6.7	6.7	6.7	0
Subtotal <sup>3</sup>	48.1	0	0	1.9	1.9	1.9	0
<i>Minor Harvest Area 3625</i>							
210	53.3	6.7	6.7	0	6.7	0	13.3
211	0	0	0	0	33.3	0	16.7
212	0	60.0	33.3	13.3	20.0	13.3	0
213	60.0	0	0	0	20.0	20.0	0
214	57.1	0	0	0	0	0	0
215	58.6	0	0	3.4	3.4	3.4	0
217	66.7	0	0	6.7	0	6.7	6.7
218	50.0	0	0	0	0	0	0
Subtotal <sup>3</sup>	46.2	9.6	5.8	3.8	7.7	4.8	3.8
<i>Minor Harvest Area 3626</i>							
219	20.0	20.0	0	0	40.0	40.0	20.0
220	50.0	0	0	0	0	0	0
221	20.0	0	0	0	0	0	0
Subtotal <sup>3</sup>	38.5	3.8	0	0	7.7	7.7	3.8
Total <sup>4</sup>	46.9	4.6	2.3	5.4	4.2	4.6	3.1

SOURCE: Forest Service in consultation with ADF&G (SEIS Planning Record). See also Consolidated Appendix, Volume II, C-3, on data adequacy and models used.

<sup>1</sup> Numbers reflect changes in brown bear habitat capability resulting from previous timber harvest through September 1, 1988.

<sup>2</sup> No timber harvest is projected on Native Corporation land.

<sup>3</sup> This value represents the percent reduction in the entire minor harvest area.

<sup>4</sup> This value represents the percent reduction in the entire analysis area.

Table 4-21

**Projected Reduction of Potential Brown Bear Numbers Based on a Habitat Capability Model**

VCU	Present Brown Bear Habitat Capability	Alternative					
		1	2	3	4	5	6
<i>Minor Harvest Area 3523</i>							
203	11	0	0	4	0	0	0
204	16	1	0	5	0	4	3
204 <sup>1</sup>	3	0	0	0	0	0	0
205	1	0	0	0	0	0	0
205 <sup>1</sup>	2	0	0	0	0	0	0
206 <sup>1</sup>	0	0	0	0	0	0	0
216	6	0	0	0	0	0	0
Subtotal	39	1	0	9	0	4	3
<i>Minor Harvest Area 3524</i>							
207	13	0	0	0	0	0	0
207 <sup>1</sup>	4	0	0	0	0	0	0
208	4	0	0	0	0	0	0
209	6	0	0	1	1	1	0
Subtotal	27	0	0	1	1	1	0
<i>Minor Harvest Area 3625</i>							
210	7	1	1	0	1	0	2
211	6	0	0	0	2	0	1
212	15	9	5	2	3	2	0
213	2	0	0	0	1	1	0
214	3	0	0	0	0	0	0
215	12	0	0	1	1	1	0
217	5	0	0	1	0	1	1
218	6	0	0	0	0	0	0
Subtotal	56	10	6	4	8	5	4
<i>Minor Harvest Area 3626</i>							
219	4	1	0	0	2	2	1
220	8	0	0	0	0	0	0
221	4	0	0	0	0	0	0
Subtotal	16	1	0	0	2	2	1
Total	138	12	6	14	11	12	8

SOURCE: Forest Service in consultation with ADF&G (SEIS Planning Record). See also Consolidated Appendix, Volume II, C-3, on data adequacy and models used.

<sup>1</sup> No timber harvest is projected on Native Corporation land.

## 4 Environmental Consequences

Table 4-22

### Projected Percent Reduction of Potential Pine Marten Numbers Based on a Habitat Capability Model

VCU	Previous Change <sup>1</sup>	Alternative					
		1	2	3	4	5	6
<i>Minor Harvest Area 3523</i>							
203	12.5	0	0	37.5	0	0	0
204	19.7	21.1	18.3	73.2	18.3	66.2	47.9
204 <sup>2</sup>	92.3	0	0	0	0	0	0
205	25.0	0	0	0	0	0	0
205 <sup>2</sup>	93.3	0	0	0	0	0	0
206 <sup>2</sup>	88.9	0	0	0	0	0	0
216	63.6	0	0	0	0	0	0
Subtotal <sup>3</sup>	43.9	8.8	7.6	35.7	7.6	27.5	19.9
<i>Minor Harvest Area 3524</i>							
207	12.9	0	0	0	0	0	0
207 <sup>2</sup>	90.7	0	0	0	0	0	0
208	40.0	0	0	0	0	0	0
208 <sup>2</sup>	0	0	0	0	0	0	0
209	91.7	0	0	0	0	0	0
Subtotal <sup>3</sup>	65.1	0	0	0	0	0	0
<i>Minor Harvest Area 3625</i>							
210	92.3	0	0	0	0	0	0
211	12.5	0	0	0	81.3	0	0
212	15.4	10.3	5.1	0	12.8	12.8	0
213	13.3	6.7	0	0	6.7	6.7	6.7
214	18.8	12.5	6.3	0	0	0	0
215	65.2	3.0	1.5	0	4.5	4.5	0
217	91.4	0	0	2.9	2.9	0	0
218	92.3	1.9	1.9	5.8	5.8	3.8	0
Subtotal <sup>3</sup>	61.9	3.6	1.8	1.4	9.4	4.0	1.0

(Continued)

Table 4-22 (Continued)

**Projected Percent Reduction of Potential Pine Marten Numbers Based on a Habitat Capability Model**

VCU	Previous Change <sup>1</sup>	Alternative				6
		1	2	3	4	
<i>Minor Harvest Area 3626</i>						
219	15.0	0	0	0	0	5.0
219 <sup>4</sup>	0	0	0	0	0	0
220	73.9	0	0	0	0	0
220 <sup>4</sup>	0	0	0	0	0	0
221	28.6	0	0	0	0	0
221 <sup>4</sup>	0	0	0	0	0	0
Subtotal <sup>3</sup>	44.6	0	0	0	0	1.1
Total <sup>5</sup>	55.5	3.7	2.7	9.7	5.8	5.4

SOURCE: Forest Service in consultation with ADF&G (SEIS Planning Record). See also Consolidated Appendix, Volume II, C-3, on data adequacy and models used.

<sup>1</sup> Numbers reflect changes in pine marten habitat capability resulting from previous timber harvest through September 1, 1988.

<sup>2</sup> No timber harvest is projected on Native Corporation land.

<sup>3</sup> This value represents the percent reduction in the entire minor harvest area.

<sup>4</sup> No harvest is projected on Private land.

<sup>5</sup> This value represents the percent reduction in the entire analysis area.

## 4 Environmental Consequences

Table 4-23

### Projected Reduction of Potential Pine Marten Numbers Based on a Habitat Capability Model

VCU	Present Pine Marten Habitat Capability	Alternative					
		1	2	3	4	5	6
<i>Minor Harvest Area 3523</i>							
203	21	0	0	9	0	0	0
204	57	15	13	52	13	47	34
204 <sup>1</sup>	1	0	0	0	0	0	0
205	6	0	0	0	0	0	0
205 <sup>1</sup>	1	0	0	0	0	0	0
206 <sup>1</sup>	2	0	0	0	0	0	0
216	8	0	0	0	0	0	0
Subtotal	96	15	13	61	13	47	34
<i>Minor Harvest Area 3524</i>							
207	27	0	0	0	0	0	0
207 <sup>1</sup>	4	0	0	0	0	0	0
208	9	0	0	0	0	0	0
208 <sup>1</sup>	1	0	0	0	0	0	0
209	3	0	0	0	0	0	0
Subtotal	44	0	0	0	0	0	0
<i>Minor Harvest Area 3625</i>							
210	3	0	0	0	0	0	0
211	14	0	0	0	13	0	0
212	33	4	2	0	5	5	0
213	13	1	0	0	1	1	1
214	13	2	1	0	0	0	0
215	23	2	1	0	3	3	0
217	3	0	0	1	1	0	0
218	4	1	1	3	3	2	0
Subtotal	106	10	5	4	26	11	1

(Continued)

Table 4-23 (Continued)

**Projected Reduction of Potential Pine Marten Numbers Based on a Habitat Capability Model**

VCU	Present Pine Marten Habitat Capability	Alternative					
		1	2	3	4	5	6
<i>Minor Harvest Area 3626</i>							
219	17	0	0	0	0	0	1
219 <sup>2</sup>	2	0	0	0	0	0	0
220	12	0	0	0	0	0	0
220 <sup>2</sup>	10	0	0	0	0	0	0
221	10	0	0	0	0	0	0
221 <sup>2</sup>	0	0	0	0	0	0	0
Subtotal	51	0	0	0	0	0	1
Total	297	25	18	65	39	58	36

SOURCE: Forest Service in consultation with ADF&G (SEIS Planning Record). See also Consolidated Appendix, Volume II, C-3, on data adequacy and models used.

<sup>1</sup> No timber harvest is projected on Native Corporation land.

<sup>2</sup> No timber harvest is projected on Private land.



Bald Eagle

**Bald Eagle**

Bald eagles use beach fringe, estuarine fringe, and streamside riparian habitats. Over 90 percent of the original beach fringe and streamside riparian habitats would remain under the harvest alternatives. No additional timber harvest is proposed in the estuarine fringe habitat. Although timber harvest would affect some of the beach fringe and streamside riparian habitats, no eagle nest trees or buffer zones would be affected by any of the proposed alternatives.

The State Senate and House of Representatives are currently considering legislation to revise the Alaska Forest Practices Act. If the proposed legislation passes as currently written, present timber harvest standards that protect the bald eagle on National Forest land will also apply on private land.

**Vancouver Canada Goose**

Vancouver Canada geese are unique among all subspecies of Canada geese in that they use forested habitat for nesting and brood rearing. Timber harvest activities in estuarine fringe, inland wetland, and forested habitats could affect these geese. No harvest is proposed in the estuarine fringe and inland wetland habitats and over 90 percent of the forested habitat would remain.

**Conclusions for Wildlife Habitat Effects**

The effects from additional timber harvest activities on wildlife or their habitats are expected to be varied through the balance of the Supplement time frame. Evaluation of the entire Analysis Area reveals less than 10 percent of the overall habitats would be affected. Many of the effects would be less than 1 percent or even unmeasurable. Potential project effects on projected Sitka black-tailed deer, brown bear, and pine marten habitat capability range from slight to substantial, particularly when project effects are combined with past effects and are carried into the foreseeable future.



Vancouver Canada Goose

## 4 Environmental Consequences

### Fisheries

Each of the action alternatives has potential for impacting the aquatic habitat on National Forest lands in Analysis Area 3. Similarly, actual harvest activities completed on private lands could impact streams on those lands. The level of impact, if any, is dependent upon the application of Best Management Practices (BMPs). Timber harvest adjacent to streams may affect water temperature and debris recruitment; road construction and use may cause increased sedimentation; and installation of road crossings could alter or eliminate access to anadromous fish habitat. Timber harvest standards and guidelines are applied on National Forest lands to minimize each of these potential impacts. Similarly, adherence to the State Forest Practices Act on private lands will minimize potential impacts to streams.

The potential for fisheries impacts increases as the disturbance increases along streams. Timber harvest to the stream bank is not proposed for either alternative. Rather, buffers of 25 to 100 feet in width would be left adjacent to streams where harvest takes place on National Forest land according to the Aquatic Habitat Management Handbook (USDA Forest Service 1986a) to mitigate any potential impacts. Table 4-24 shows the width and length of buffers along Class I, II, and III streams for each alternative. The location of the proposed harvest units in relation to the Class I and II Aquatic Habitat Management Units (AHMUs) can be seen in the reproduced aerial photos on the back of the Unit Cards in Appendix A-1, or on the Alternative Maps provided with this SEIS. The maps show more clearly where the streams are located and where the breaks between stream classifications occur. The position and location of harvest units on private land is not known.

Aquatic Habitat Management Unit (AHMU) prescriptions differ from the National Marine Fisheries Service (NMFS) 30-meter buffer policy in that AHMU prescriptions allow the opportunity for some management activities within buffer areas. These management activities may occur only after consideration of the specific needs of the stream based on site-specific criteria. Application of the NMFS 30-meter policy to this project would result in lower timber volumes, and would not necessarily provide a higher level of protection for the fisheries re-

*Salmon are a Key Staple for Many Brown Bear*



Table 4-24  
**Buffer Width and Distance Along Stream (Feet)**

Alternative	VCU	Unit Number	Class I		Class II		Class III	
			Buffer Width	Distance	Buffer Width	Distance	Buffer Width	Distance
1	210	14			50	3000		
		15			50	1200 <sup>1</sup>		
	212	8			100	2100 <sup>1</sup>		
		26	100	800				
		28	100	2000				
		6					50	700
	214	190			50	1000 <sup>1</sup>		
		5			50	1400		
	215	OH17	50	700				
		16	50	700				
Total Distance				4200		8700		700
3	203	126	100	1300				
		127	100	3700 <sup>1</sup>				
		129			50	1000 <sup>1</sup>		
		130			50	1300 <sup>1</sup>		
	204	90					50	1000 <sup>1</sup>
		91	50	3300			50	900
		121	100	2200				
		122	100	2200				
		123	100	900 <sup>1</sup>				
		124			50	1600 <sup>1</sup>		
		125			50	2100 <sup>1</sup>		
		157	100	2800				
		197	100	2200				
		198	100	2800 <sup>1</sup>				
		210	1				50	4000
		12			50	1000		
		56			50	700		
		218	33	50	700			
Total Distance				17100		7700		5900

(Continued)

## 4 Environmental Consequences

Table 4-24 (Continued)

**Buffer Width and Distance Along Stream (Feet)**

Alternative	VCU	Unit Number	Class I		Class II		Class III	
			Buffer Width	Distance	Buffer Width	Distance	Buffer Width	Distance
4	209	13	75	500				
		16			50	300		
	210	6			50	1500		
		50			50	2100 <sup>1</sup>		
					50	1000		
	211	1			50	3700		
		60	100	2900				
		63			50	4300		
		64			50	1700		
		65			50	900		
		66			50	1800		
		67			50	2800		
		180	50	2700				
217	56				50	700		
	218	33	50	700				
		Total Distance		6800		18100		0
5	204	90					50	1000 <sup>1</sup>
							50	900
	209	91	50	3300				
		97			50	1700 <sup>1</sup>		
		137			50	1300 <sup>1</sup>	50	1000 <sup>1</sup>
		13	75	500				
	210	16			50	300		
		6			50	1500		
		50	50	2100 <sup>1</sup>				
			50	1000				
	215	63			50	4300		
		64			50	1700		
		65			50	900		
		66			50	1800		
		67			50	2800		
		180	50	2700				
		56			50	700		
Total Distance				2100		46900		2900

(Continued)

Table 4-24 (Continued)

**Buffer Width and Distance Along Stream (Feet)**

Alternative	VCU	Unit Number	Class I		Class II		Class III	
			Buffer Width	Distance	Buffer Width	Distance	Buffer Width	Distance
6	204	122	100	2200				
		139			50	500 <sup>1</sup>		
		140	100	1500 <sup>1</sup>				
			50	800				
		141	100	4500				
		142	100	1700				
		157	100	2800				
	210	6			50	1500		
		156					50	500 <sup>1</sup>
<b>Total Distance</b>				<b>13500</b>		<b>2200</b>		<b>1000</b>

SOURCE: SEIS Planning Record.

<sup>1</sup> Buffer is on both sides of stream.

source than that provided by the AHMU policy. AHMU prescriptions are designed to provide resource protection based on site specific needs. Murphy and Koski (1989) show that a 30-meter (100-foot) buffer provides 99 percent of the large organic debris (LOD) for Class I and II streams. Twenty-three meters (75 feet) would maintain 97 percent of LOD, 15 meters (50 feet) would maintain 90 percent of LOD, and 8 meters (25 feet) would maintain at least 83 percent of potential LOD.

The proposed construction of new roads that will require application of prescriptions listed in the Aquatic Habitat Management Unit (AHMU) handbook are summarized by alternative in Table 4-25. New roads that would parallel Class I streams range from 0.2 miles for Alternative 6, to 0.8 miles for Alternative 4; while new roads that would parallel Class II streams range from 0.2 miles for Alternatives 4 and 6, to 0.5 miles for Alternative 5.

### Conclusions for Fish Habitat Effects

The potential effects of the proposed alternative timber harvest plans on aquatic habitat should be minimal or eliminated by application of the Forest Service standards, guidelines, and prescriptions described in the AHMU Handbook (USDA Forest Service 1986a). The AHMU Handbook provides standard prescriptions that are designed to protect water quality and the productivity of fish habitat. The standards and guidelines define management goals and habitat protection prescriptions organized by AHMU classes.

Class I AHMUs have the most specifically defined, restrictive direction, and Class II and Class III are less restrictive. The prescriptions are organized into three levels including: (1) temperature sensitivity constraints; (2) management prescriptions involving large woody debris, water quality, streambank and channel stability, fish passage, and special road construction; and (3) management opportunity prescriptions to increase primary and secondary productivity. The prescriptions for temperature sensitive streams are examined first to determine possible management options since these prescriptions are overriding in importance. Management prescriptions for temperature sensitive streams, if applied, preclude some of the other prescriptions listed for other aquatic habitat concerns. Prescriptions for fish passage through

## 4 Environmental Consequences

Table 4-25  
**Miles of Streams with AHMU Protection Measures by Stream Class<sup>1</sup>**

Alternative	VCU	Miles in AHMU	
		Class I	Class II
1	209	0.2	0
	210	0	0.5
	212	1.5	1.9
	213	0.1	0.3
	214	0.1	0.6
	215	0.1	0
	219	0	0.1
		<hr/>	<hr/>
		Total	2.0
			2.4
2	209	0.1	0
	210	0	0.2
	212	0	0.7
	Total	0.1	0.9
3	203	0.1	0.1
	204	0.3	0.2
	Total	0.4	0.3
4	209	— <sup>2</sup>	0.1
	210	0.2	0.1
	212	0.2	— <sup>2</sup>
	215	0.3	0
	219	— <sup>2</sup>	— <sup>2</sup>
	Total	0.8 <sup>3</sup>	0.2 <sup>3</sup>
5	204	0.2	0.3
	209	— <sup>2</sup>	0.1
	210	0.1	0
	212	— <sup>2</sup>	0
	215	0.1	0
	219	0	— <sup>2</sup>
	Total	0.4 <sup>3</sup>	0.5 <sup>3</sup>
6	204	0.2	0.1
	210	0	— <sup>2</sup>
	219	0	— <sup>2</sup>
	Total	0.2	0.2 <sup>3</sup>

SOURCE: SEIS Planning Record

<sup>1</sup> National Forest land.

<sup>2</sup> This value less than 0.05 miles.

<sup>3</sup> This total includes values less than 0.05 miles.

crossing structures are guided by an economic analysis (Forest Service 1986a), which compares the resource value to the additional expenses required to provide passage. Each Unit Card (Appendix A-1) describes AHMU prescription applications.

Any potential impacts to fish production as a result of the proposed alternative timber harvest plans are unlikely or would be undetectable. This conclusion is based on the following:

- Measurable changes in stream temperatures will be avoided through the use of AHMU Handbook buffer descriptions.
- The amount of habitat affected is relatively small because a maximum of 1.6 percent, depending on alternative, of the available Class I and Class II habitat would potentially be affected by adjacent timber harvest and road construction activities.
- It is unlikely that all habitats would be impacted because of site specific management prescriptions described in the AHMU handbook (Forest Service 1986a).

## Watersheds

Streamflow concerns expressed in 1986-90 FEIS appeals regarding timber harvesting revolve around two perceived issues:

- initial peak flow increases following timber harvest that could accelerate channel erosion and destruction of fish habitat, and
- long-term reduction in summer low flow following establishment of second-growth timber stands that could result in loss of summer fish rearing habitat.

Forest vegetation influences stream runoff through water uptake for growth (transpiration) and through evaporation of precipitation intercepted by the forest canopy. Clearcut blocks may alter runoff through changes in snow storage and snow melt timing. Stream runoff can

*Watersheds in Analysis Area 3 Have a High Level of Water Quality*



## 4 Environmental Consequences

*The Commercial Salmon Trolling Fleet Contributes to Southeast Alaska's Economy*



also be affected through conversion of overmature forest to a denser, more vigorous second-growth forest that may increase evapotranspiration losses and reduce streamflow during the summer growing season.

For the purpose of looking at impacts to watersheds, it is useful to address two types of watersheds: upland channels, or mountainslope ravines, and lowland channels. Upland channels include mostly Class III AHMUs, where the primary management objective is to protect water quality. These streams have little or no resident fish habitat. Lowland channels are primarily low gradient floodplain channels and moderate to low gradient alluvial fan and footslope channels. Lowland channels fall within the Class I and II AHMU categories, where the primary management objective is to protect important anadromous and resident fish habitat. Table 4-26 shows the proposed harvest by channel type for all alternatives in Analysis Area 3.

A large body of scientific literature has been compiled on the effects of timber harvesting on water yield from forested watersheds. Bosch and Hewlett (1982) in a review of 94 catchment experiments nationwide found that an average of 25 percent to 30 percent harvest level was required to detect measurable effects in stream runoff. Water yield studies in the Pacific Northwest have shown an average of 25 percent increase in annual runoff when 25 percent to 100 percent of a watershed was clearcut harvested (Rothacher 1965, 1970, Rothacher, et al. 1967, Harr 1976, 1983). However, in the same studies the number of summer low-flow days significantly decreased the first few years after harvesting. No increases in destructive peak flows were observed except in a case where 25 percent of the watershed was severely compacted by skid trails and roads. In the Maybeso Creek watershed on Prince of Wales Island no detectable changes in streamflow were found after 25 percent of the watershed was clearcut (Meehan, et al. 1969).

In general, these research findings indicate changes in stream flow, due to vegetative manipulation, are difficult to quantify as is the duration of those changes. Also, stream flow changes

Table 4-26  
**Acres of Timber Harvest by Watershed Type**

	VCU	Lowland Channel	Upland Channel
<i>Alternative 1</i>	204	21	0
	210	82	0
	212	392	469
	213	53	64
	214	224	72
	215	0	65
	217	56	0
	218	0	20
	219	0	91
	Total	828	781
Percent		51.5	48.5
<i>Alternative 2</i>	212	141	157
	214	148	30
	Total	289	187
	Percent	60.7	39.3
<i>Alternative 3</i>	203	449	276
	204	848	237
	208	0	86
	209	39	45
	210	0	296
	212	141	188
	217	60	73
	218	153	394
	Total	1,690	1,595
	Percent	51.4	48.6

Continued

## 4 Environmental Consequences

Table 4-26 (Continued)  
**Acres of Timber Harvest by Watershed Type**

	VCU	Lowland Channel	Upland Channel
<i>Alternative 4</i>			
209	63	118	
210	0	500	
211	0	246	
212	0	100	
213	0	153	
215	38	371	
217	60	73	
218	153	562	
219	85	0	
Total	399	2,123	
Percent	15.8	84.2	
<i>Alternative 5</i>			
204	412	343	
209	63	118	
210	0	348	
212	0	100	
213	0	153	
215	38	285	
217	60	0	
218	84	330	
219	0	85	
Total	657	1,762	
Percent	24.3	75.7	
<i>Alternative 6</i>			
204	328	366	
210	0	320	
211	0	87	
213	0	188	
217	0	73	
219	0	115	
Total	328	1,149	
Percent	22.2	77.8	

SOURCE: SEIS Planning Record.

are highly variable and difficult to detect between watersheds based on differences in geography, land forms, soil types, vegetation, climate, and size of watershed.

Much less information exists for timber harvesting effects on snow storage and snow melt processes, particularly in the rain dominated coastal runoff regimens found in Southeast Alaska. Recent studies have shown that clearcutting in transient snow zones can increase the magnitude of some high flow events in Pacific Northwest watersheds (Christner and Harr 1982, Harr 1981). Harr (1981) estimates that increased heat transfer to snowpacks in clearcut units may result in up to 25 percent increase in soil water input under certain climatic conditions. However, little data are available to evaluate the influence of clearcuts at middle and upper watershed elevations on winter rain-on-snow peak runoff events (Chamberlin 1982). Rain-on-snow runoff events may occur infrequently in Southeast Alaska under conditions of wet, shallow snowpack coupled with heavy rain, high winds, and warm air masses. The probability for conditions existing within a given watershed to trigger a winter flood event will vary according to elevation, aspect, and local climate.

Timber harvest levels proposed by the alternatives on National Forest and Native Corporation lands were shown in Tables 4-2 through 4-7. Since the percentages projected for harvest are less than 25 percent on a VCU basis, the alternatives proposed in 1986-90 would not result in appreciable changes in average low or peak flows.

Potential effects of timber harvest on winter peak flows cannot be fully evaluated due to lack of data and knowledge about rain-on-snow runoff processes in Southeast Alaska. Because cutting units are dispersed throughout watersheds and the relative percentage of clearcut units to total watershed area is small, however, the risk of increasing the frequency of destructive rain-on-snow runoff peaks is expected to be low.

### Sediment

Erosion of soil and subsequent sedimentation in streams is a major concern associated with timber harvesting activities and road construction and have resulted in stringent standards and guidelines. High concentrations of fine sediment in surface water and stream beds may adversely affect fish egg incubation in gravel beds and fry emergence from the gravel. Extremely high levels or chronic inputs of suspended sediment can also affect fish behavior and the abundance of aquatic insects, the primary fish food during the freshwater rearing phase of anadromous fish.

Timber harvesting activities may cause sedimentation in a number of ways, for example:

- stream channel and stream bank disturbances from yarding and felling trees adjacent to or across stream channels or from installation of bridges and culverts;
- road runoff from road construction and use; and
- mass soil movement (landslides) from road failure or slope failures in harvest units.

The region is developing Best Management Practices, the purpose of which is to reduce impacts to water quality associated with land management activities with the overall goal of meeting State water quality standards. In a Memorandum of Understanding between the Forest Service and Alaska Department of Environmental Conservation, the agencies have agreed to document management practices that effectively minimize the impacts from nonpoint sediment sources caused by timber management activities (Forest Service 1980b). Selected small watersheds in the Chatham Area have been monitored for a number of years to evaluate the effectiveness of some of the Best Management Practices. Sediment monitoring data were collected from the Indian River and the Kadashan River watersheds for a number of years prior to and following logging activity (Paustian 1988). Sediment discharge measurements taken on the mainstem of Indian River showed no significant change in sediment delivery following logging and road building that entered 8 percent of an 11 square mile watershed. In the Ka-

## 4 Environmental Consequences

dashan River study, sediment sources from road building were measured below road crossings on three first- and second-order tributary streams. Short-term impacts of road building resulted in increased suspended sediment yield equivalent to 2 percent of the estimated annual yields. Potential increases in total estimated sediment yield over a two-year period after road construction ranged from 20 percent to 66 percent in the three study streams. However, Paushtian (1988) predicted that sediment inputs of this type and amount would not have been detectable in the mainstem of Kadashan River due to large in-channel sediment storage that tends to attenuate sediment delivery from short-term disturbances.

The conclusion reached from these two studies is that logging roading disturbances were not great enough to cause changes in sediment yield above natural levels of sediment transport measured in the river prior to the activity. This interpretation of the study results, however, only applies to low-level water quality impacts that occur within the first few years following logging. Data concerning the long-term impacts of logging on sediment in this area are not available. Swanston (1985) has instituted studies that will better address cumulative erosion and sediment delivery impacts associated with logging on landslide-prone areas in Southeast Alaska.

The Unit Cards in Appendix A-1 document the application of AHMU Handbook buffer prescriptions. These buffers which are prescribed for all Class I and Class II streams, in addition to maintaining temperature stabilizing vegetative cover and a source of large organic debris, will provide undisturbed areas along streams that will act as a catch basin or filter to intercept potential sediment originating in disturbed areas in the harvest units.

### Marine Environment

At the four existing log transfer facilities, Long Island and Kennel Creek LTFs, the effects of the alternatives will be small incremental additions to existing bark deposits, shading effects, etc. These would result in minor effects on benthic organisms from any of the action alternatives.

The effects of a log transfer facility on salmon and herring is difficult to address as no known data are available on the relationship between a log transfer facility and these species. Both species inhabit the unimpacted water column, as opposed to the impacted substrate, and negative impacts are expected to be small, if any. The added increment from any of the action alternatives would be even smaller. In general, any potential deleterious effects to the marine environment would be extremely small.

Two new log transfer facilities have been constructed for Analysis Area 3, False Bay and Seal Creek LTFs. Initial construction of the False Bay LTF covered approximately 0.3 acres of intertidal benthic habitat with the low angle slide, adjacent roads, and bulkhead. An additional 0.1 acre of benthic habitat adjacent to the slide would be lost to scouring and compaction of the bottom.

The False Bay LTF is also projected to develop a bark deposit immediately adjacent to the transfer facility and in raft pens and raft storage areas. However, deposits should be small because of the deep water and high rate of flushing in False Bay and because bark will be removed from the slide in compliance with bark accumulation guidelines. Continued operations would result in only small incremental additions to these bark deposits. Impacts from construction and operation of a log transfer facility at False Bay are covered more fully in the False Bay Environmental Assessment (Appendix B-1, Draft Phase II SEIS).

Construction of the log transfer facility at Seal Creek covered approximately 1.2 acres of natural benthic habitat with rock fill for the slide, bulkhead, and adjacent ramps and roads. A bark deposit is also projected to develop at the Seal Creek LTF. Although the rate of flushing at the Seal Creek site is lower than at False Bay, the volume of timber proposed for transfer through the Seal Creek LTF is relatively low. Therefore, bark deposits are expected to be small at the Seal Creek LTF. Initial accumulation of bark deposits at these new log transfer

*Forest Service Wanigan at  
Whitestone harbor Serves as  
a Bunkhouse*



facilities will have greater impacts on the benthic community than later incremental additions to an existing bark deposit. Impacts from construction and operation of a log transfer facility at Seal Creek on Freshwater Bay are covered more fully in the Seal Creek Environmental Assessment (Appendix B-2, Draft Phase II SEIS).

## Land Status

The potential effects of harvest and road construction activities on land status and the suggested mitigation actions are described in this section. Each of the action alternatives would affect private or selected land, state land, or special permit sites somewhat. Alternative 3 would have the least impact on private lands, native allotment applications, state lands, and special-use permit areas, while Alternative 6 would appear to have a potentially greater effect than the other alternatives.

None of the alternatives would affect private or selected land, state lands or special permit sites within VCUs 205, 207, 214, 220, and 221.

No new log transfer facilities are proposed by any of the alternatives. The Forest Service holds valid Alaska Department of Natural Resources (DNR) easements and rights-of-way for the existing and proposed roads and log transfer facilities at Kennel Creek, False Bay, and Seal Creek, all of which are proposed for use under one or more of the alternatives.

In addition to the above general effects, specific effects that could occur under each alternatives are described below.

### Alternative 1

Unlike the action alternatives (3 through 6), the effects of Alternative 1 are compared to the September 1, 1988 baseline condition. Furthermore, the activities proposed under this alternative and their effects would take place during 1989 and 1990, and would occur under all of the action alternatives as well.

## **4 Environmental Consequences**

In VCU 204, unit 95 is close to land owned by the Sealaska Corporation. Private land boundaries would be verified on-the-ground before harvest of this unit proceeds.

In VCU 208, units 10 and 11 are within the boundaries of land selected by the Huna Totem Corporation as well as a timber sale contingency area. As required by Section 908 of ANILCA, the Forest Service would obtain a written agreement with the Huna Totem Corporation, and from the Seakaska Corporation if required, prior to timber harvest. The Huna Totem Resolution 82-3 may fulfil the agreement with Huna Totem, however any deviations from it must be approved by them.

Harvest unit 12 in VCU 209 is near land selected by Huna Totem. The Forest Service would avoid this land during harvest activities or obtain an agreement with Huna Totem.

In VCU 210, mining claimants along Gypsum Creek would be informed prior to harvesting units 17 and 18 in order to avoid potential conflict. If timber is transferred through False Bay (VCU 210) and road construction could potentially encroach on Native Allotment claim AA-6543, the Forest Service would obtain a Deed of Further Assurance prior to road construction. In addition, care would be taken to avoid Native Allotment AA-6543 while harvesting unit 11.

In VCU 212, unit 10 is near the boundaries of private land on Gypsum Creek. Although the private land has been surveyed, its location on-the-ground would be verified prior to timber harvest in order to avoid trespass. In addition, the Forest Service would notify mining claimants along Gypsum Creek prior to harvesting units 24 and 34 to avoid potential conflicts there.

### **Alternative 2**

Because Alternative 2 consists of those activities proposed for Alternative 1 in 1989, its effect on land status would be similar to the effects of Alternative 1 for those VCUs affected.

Although some harvest would occur in VCU 209, 214, 215, and 218; there would be no effect on land status. In VCU 210, the effect of Alternative 2 on land status would be the same as for Alternative 1 without units 17 and 18. In VCU 212, the effect would be the same as for Alternative 1 without units 10 and 34.

### **Alternative 3**

The effects of Alternative 1, described above, should be added to the following effects of this Alternative.

The northern portion of VCU 204 falls within lands selected by the Sealaska Corporation, some of which have been conveyed into private ownership. The private lands have not been surveyed. The only planned activity that falls within 1 mile of the boundary is construction of the access road where it joins the main haul route to Long Island. Care would be taken to ensure this new road construction does not encroach on lands belonging to the Sealaska Corporation.

In VCU 208, units 3 and 4 are within the boundaries of land selected by the Huna Totem Corporation as well as a timber sale contingency area. As required by Section 908 of ANILCA, the Forest Service would obtain a written agreement with the Huna Totem Corporation, and from the Seakaska Corporation if required, prior to timber harvest. The Huna Totem Resolution 82-3 may fulfil the agreement with Huna Totem, however any deviations from it must be approved by them.

If timber is transferred through False Bay (VCU 210) and road construction could encroach on Native Allotment claim AA-6543, the Forest Service would obtain a Deed of Further Assurance prior to road construction.

In VCU 212, unit 4 is near or within the boundaries of private land on Gypsum Creek. Although the private land has been surveyed, its location on-the-ground would be verified prior to timber harvest in order to avoid trespass. In addition, the Forest Service would notify mining claimants along Gypsum Creek of timber harvest plans prior harvest to avoid potential conflicts there.

Alternative 3 would require obtaining an easement from the Bureau of Land Management for a haul road passing through the Freshwater Bay state selection in VCU 215. The road is existing and the Forest Service would request a reservation of the easement prior to conveyance.

Unit 22 of VCU 218 is within 1 mile of a state selection at Pavlof Lake. The boundaries are not surveyed and care should be taken to avoid encroaching on this selection.

#### **Alternative 4**

The effects of Alternative 1, described above, should be added to the following effects of this Alternative.

There is a Lighthouse Reserve in the northeast corner of VCU 211. The boundary line lies approximately 1/4 to 1/2 mile from units 4 and 5. Care would be taken not to encroach on this Reserve without first obtaining permission from the U. S. Coast Guard.

In VCUs 212 and 213, units and access road are adjacent to or within 1/2 mile of private lands at Gypsum Creek. The lands have been surveyed and their boundaries would be located on the ground to avoid encroachment. The access roads in VCU 212 and 213 may also cross mining claims in the Gypsum Group. The claimants would be notified of the Forest Service plans through the Supervisor's Office Mining Geologist.

Alternative 4 would have the same effect in VCUs 215 and 217 as Alternative 3.

Unit 36 in VCU 219 is located very close to private lands at Tenakee Springs. The boundary has been surveyed and it would be located on the ground to prevent encroachment.

#### **Alternative 5**

The effects of Alternative 1, described above, should be added to the following effects of this Alternative.

Alternative 5 would have the same effect in VCUs 204 and 215 as Alternative 3. Alternative 5 would have the same effect in VCUs 212, 213, 215, and 219 as Alternative 4.

#### **Alternative 6**

The effects of Alternative 1, described above, should be added to the following effects of this Alternative.

The northern portion of VCU 203 falls within lands selected by the Sealaska Corporation. The only planned activity that falls within 1 mile of the boundary is construction of the access road where it joins the main haul route to Long Island. Care would be taken to ensure this new road construction does not encroach on lands belonging to the Sealaska Corporation.

Alternative 6 would have the same effect on VCU 204 as Alternatives 3 and 5. Unit 151 in VCU 210 and Unit 150 in VCU 211 are within approximately 1/4 to 1/2 mile of Native Allotment application AA-6543 at False Bay. Until the Bureau of Land Management adjudicates the claim, the claim must be treated as valid and on-the-ground verification would be necessary to ensure encroachment does not occur.

Alternative 6 would have the same effect in VCU 213 on the mining claims and activities adjacent to private lands at Gypsum Creek as Alternatives 4 and 5. Unit 152 is also located close to a special use permit for a shelter, located at Iyouken Cove. The shelter location

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would be verified so activities would not disturb it. In VCU 213, the haul routes include an existing road that passes very close to Native Allotment application AA-6543 at False Bay.

Alternative 6 would have the same effect on VCU 218 as Alternatives 3 and 4. Alternative 6 would have the effect on VCU 219 as Alternatives 4 and 5.

### Recreation

To determine the environmental consequences for the recreation resource in Analysis Area 3, it is necessary to examine expected future trends in recreation use and then determine how management activities might influence those trends. Although historical use figures fluctuate widely and depend somewhat on uncontrolled variables such as weather conditions and wildlife and fish populations, general trends are apparent. Under current conditions, use within the study area is expected to increase by less than 2 percent annually. Hunting, fishing, boating, and saltwater canoeing and kayaking will be the predominate recreational activities. Use by out of state residents (currently about one third of the total use) is expected to grow as interest continues to develop in the unique experience of Southeast Alaska. There is potential for increased outfitter/guide activities and for commercial floating lodges in future development in portions of Analysis Area 3. Facility development will correspond with anticipated growth and reflect user preferences for outdoor activities.

These predicted trends are based on the following assumptions:

- a. Alaska's population growth has leveled off. Declines in some communities may occur as the economy changes.
- b. Tourism in the State has been increasing at 5 percent per year.
- c. Recreation cabin use on the Chatham Area of the Tongass National Forest is increasing yearly.
- d. State surveys have shown that recreation activity preferences by residents continue to be boating, fishing, and hunting.

*Planks and Cord Wood are Often Used to Cross Muskega on Hiking Trails in Southeast Alaska*



The impacts on recreation were assessed by analyzing the change in Recreation Opportunity Spectrum (ROS) classes that would result under each alternative and the effects of each alternative on specific recreation sites. The ROS classes are used to describe the recreational setting. Changes in ROS classes that would result from the alternatives provide an indication of the effects of the alternatives on the recreational setting, as well as recreation opportunities. The effect of each alternative on recreation sites was evaluated by analyzing the roads and cutting units proposed under each alternative and their relationship to known recreation sites.

Table 4-27 presents the resulting ROS classes under each alternative for all of Analysis Area 3. The changes in ROS classes do not consider land ownership. In general, the action alternatives would result in a shift of ROS classes from primitive and semi-primitive classes to roaded classes. Since no harvest is proposed in VCUs 205, 207, 216, 220, and 221 under any of the alternatives, no effect on recreation resources is expected in these VCUs. In addition, road closure options considered as mitigation for affects on wildlife would tend to reduce the magnitude of the shifts toward roaded classes.

### Alternative 1

Nineteen percent of the National Forest Lands in Analysis Area 3 are currently classified as providing a primitive recreation experience. Fifty-six percent of the area is currently classified as providing semi-primitive, non-motorized, which is a reflection of the existing road system in Analysis Area 3. Alternative 1 provides for a continuing shift away from primitive experiences towards more roaded, motorized recreation opportunities. Approximately 56 percent of the existing primitive and 98 percent of the existing semi-primitive opportunities will remain, following implementation of Alternative 1. Roaded, motorized opportunities will also increase by about 65 percent. The majority of these shifts will occur in VCUs 204, 209, 210, 212, 213, 214, and 219.

The northern portion of VCU 204 is private land. About 25 percent of this VCU, mostly located in the southern section of this VCU, has been roaded and logged. The proposed roading and logging units of this VCU will continue to change recreation activities from a primitive nature to a more rural experience. The roads will connect to the Hoonah road system which have established roaded recreation activities, such as 4 x 4 driving, all-terrain vehicles (ATV), motorbikes, and bicycles.

Most of the drainages in VCUs 208 and 209 have been previously logged and roaded. Proposed timber harvest activities under this alternative would take place in the same areas as

Table 4-27

### Recreation Opportunity Spectrum Classes Resulting from the Alternatives in Acres<sup>1</sup>

Alternative	Primitive I	Primitive II	Semi-Primitive Non-Motorized	Semi-Primitive Motorized	Roaded Natural	Roaded Modified	Rural
1	0	0	132,249	12,472	10,645	59,728	408
2	26,647	0	122,705	12,030	6,872	46,840	408
3	16,804	0	115,614	13,140	9,604	59,932	408
4	0	0	118,800	17,633	12,194	66,467	408
5	0	0	120,528	14,956	8,893	70,717	408
6	0	0	131,650	12,626	9,703	61,115	408

SOURCE: SEIS Planning Record.

<sup>1</sup> National Forest land.

## 4 Environmental Consequences

previous logging operations, therefore, there would be little change in existing recreation activities.

The existing road access into Iyouktug Creek and adjacent timber harvest have provided for the majority of changes in recreation opportunities in VCU 210 to date. As this VCU becomes roaded and logged, the opportunities for roaded recreation activities (including conventional road travel, motorbike, ATV, and four-wheel drive use) would be expected to increase.

VCU 212 has not, to date, been entered with timber harvest units. Alternative 1 would shift the existing primitive opportunities to a blend of semi-primitive, non-motorized, and roaded modified. VCUs 213 and 214 also have not yet been entered with timber harvest units. Alternative 1 would provide for some timber harvest but is not projected to connect the area to the existing Hoonah road system. As a result, during the logging, the recreation opportunities will be roaded modified, but after harvest the social setting will revert to a semi-primitive, motorized opportunity because of lack of access.

VCUs 215, 217, and 218 have been previously logged and are accessible by road to the Kennel Creek logging camp. Harvest activities planned for these VCUs would occur in areas of previous harvest and would not be expected to significantly affect the recreation setting. Roaded activities would be expected to continue in these VCUs under this alternative.

The northern portion of VCU 219 has a single existing road connecting to the Hoonah road system. Two previous units along the existing road provide for an existing semi-primitive, non-motorized opportunity. Alternative 1 will continue the shift from semi-primitive, non-motorized to roaded modified as new road access is built from East Point. The road will be connect the Hoonah road system to the Kennel Creek road system allowing a larger area for roaded recreation activities to take place. The new road would allow easy access to the salt-water at the entrance of Tenakee Inlet.

### Alternative 2

Alternative 2 would halt timber harvest activities after the current direction activities proposed for Alternative 1 in 1989. Therefore, Alternative 2 would result in similar impacts as Alternative 1. Recreation opportunities would shift away from primitive towards roaded recreation. The areas impacted by the shift are, however, fewer than under Alternative 1 due to the harvest units deferred in the *Hanlon v. Barton* Settlement Agreement. Sixty-six percent of existing primitive would remain, while roaded recreation opportunities would increase by about 31 percent. The majority of these shifts will occur in VCUs 209, 210, and 212.

VCUs 209, 210, and 212 have been previously roaded and logged, shifting the recreation opportunities from semi-primitive, non-motorized to roaded modified opportunities. Proposed timber harvest activities under Alternative 2 would take place in the same areas as previous logging operations, resulting in little impact to the recreation activities already taking place.

### Alternative 3

Alternative 3 would provide the greatest change from the existing situation. It would continue the current trend in Analysis Area 3 of changing recreation opportunities from primitive to semi-primitive and roaded recreation. About 14 percent of the existing primitive opportunities would remain following implementation of Alternative 3. There would be a 7 percent increase in semi-primitive, non-motorized, and a 5 percent increase in semi-primitive, motorized opportunities. The majority of the shift would be in a 49 percent increase in roaded natural and a 62 percent increase in roaded-modified opportunities. The majority of these shifts would occur in VCUs 203, 204, 208, 210, 212, 217, and 218. The effects of Alternative 3 must be added to the effects of Alternative 1, described above.

In VCU 203, which has not been previously harvested, proposed harvest would result in a shift of recreation opportunities from semi-primitive, non-motorized and roaded natural to

semi-primitive motorized and roaded modified. Some of the current primitive opportunities in this VCU would shift to roaded activities in which more social contact could be expected.

Additional new road construction in VCU 204 would extend to the present Hoonah road system. The increased access into this VCU would result in less of the current primitive recreation activities and more roaded activities, including use of off-road vehicles (ORVs), four-wheel drive vehicles, and motorbikes.

Harvest activities proposed in VCUs 208 and 209, which previously have been entered for logging and road construction, would not affect the current recreation activities there.

Proposed activities in VCUs 210 and 212 would further result in a shift from the existing primitive opportunities currently offered in these VCUs to roaded natural and roaded modified opportunities. In response to this shift, roaded activities, including conventional roaded travel and use of ATVs, four-wheel drive vehicles, and motorbikes, could be expected to increase. Other activities currently taking place in these VCUs could be expected to continue as well.

Proposed harvest activities would occur primarily in previously logged areas of VCU 217 and 218, resulting in no further change in recreation opportunities or expected activities in these VCUs.

#### **Alternative 4**

Alternative 4 maintains more of the existing primitive, non-roaded opportunities than any of the other alternatives. Approximately 70 percent of primitive and 87 percent of semi-primitive, non-motorized opportunities would remain following implementation of the Alternative. This Alternative would increase semi-primitive, motorized recreation opportunities by 45 percent, roaded natural opportunities by 9 percent, and roaded-modified opportunities by 73 percent. The majority of these shifts would occur in VCUs 209, 210, 211, 212, 213, 215, 218, and 219. The effects of Alternative 4 must be added to the effects of Alternative 1, described above.

Harvest activities planned for VCU 209 are in an area that has already been entered by logging and road construction. Alternative 4 provides for an additional shift of only 8 percent roaded modified opportunities. Therefore, no impacts are expected on any existing recreation resources.

In VCU 210, a shift from largely primitive to roaded opportunities would continue under Alternative 4. The continued expansion of the road system in this VCU, which is connected to the Hoonah road system, would provide for conventional roaded recreation use by ORVs, four-wheel drive vehicles, and motorbikes. Semi-primitive, non-motorized opportunities would be further reduced by 56 percent of its existing level with a corresponding increase in roaded modified.

Proposed activities in VCU 212 would occur in a previously logged area, therefore minimizing their effect on recreation resources. An increase in roaded activities may increase with the construction of a new roads to access the proposed harvest unit.

In VCU 211, Alternative 4 would provide for initial timber harvest and road construction, resulting in an increase in roaded-modified opportunities and a corresponding reduction in semi-primitive, motorized recreation.

In VCU 213, the additional two proposed harvest units would have little effect on existing recreation activities throughout the VCU. The effects of the proposed action would be concentrated in the location of the harvest units. New roads proposed to access the units would result in easier access to Iyoukeen Cove and Freshwater Bay beaches, and may result in increased roaded activities.

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Although VCU 215 has been previously entered for logging, proposed harvest units and roads would provide access to the unlogged northwestern portion of this VCU. Proposed activities would probably not change the existing roaded recreation activities taking place in this VCU, but would increase the extent of opportunities available with construction of new roads. Increased noise in this VCU could probably be heard by recreationists during periods of active logging.

In VCU 218, additional proposed activities would continue the trend from semi-primitive, non-motorized toward roaded modified. The existing roaded recreation activities, which include use of ORVs, four-wheel drive vehicles, and motorbikes, may be expected to increase with the construction of new roads and opening of new areas.

Additional proposed harvest activities in VCU 219 would continue to change the existing semi-primitive opportunities to about 40 percent more roaded modified opportunities. Roaded opportunities would expand as the Kennel Creek Road is extended into the north central portion of this VCU. Additional proposed roads would increase locations for beach and saltwater access along Tenakee Inlet.

### **Alternative 5**

Alternative 5 provides a 28 percent reduction in primitive opportunities and a 7 percent reduction in semi-primitive, non-motorized opportunities, with an increase of 23 percent in semi-primitive, motorized and a 200 percent increase in roaded modified recreation. The majority of these added shifts would occur in VCUs 204 and 218. The effects of Alternative 5 must be added to the effects of Alternative 1, described above.

Expansion of the existing Hoonah road system and timber harvest in VCU 204 would occur in Upper Game Creek. Existing primitive recreational opportunities on 16,804 acres in this deferred VCU would shift to roaded natural, roaded-modified, and semi-primitive, non-motorized opportunities.

### **Alternative 6**

Alternative 6 provides a 43 percent reduction in existing primitive opportunities and a 4 percent reduction in semi-primitive, motorized opportunities. This alternative would also provide for an increase of 38 percent in roaded-natural and 41 percent in roaded-modified from the existing situation. The majority of these shifts would occur in VCU 204, with minor changes occurring in VCUs 210, 211, 213, and 219. The effects of Alternative 6 must be added to the effects of Alternative 1, described above.

The changes in VCU 204 are similar to those described for VCU 204 in Alternative 5. Approximately 16,804 acres of primitive opportunities would change to 9,658 acres of semi-primitive, non-motorized opportunities; 2,514 acres would change to roaded-natural opportunities and 4,632 acres would change to roaded-modified opportunities. Similarly, changes in VCUs 210, 211, 213, and 219 would be from semi-primitive, non-motorized to roaded-modified and semi-primitive motorized recreation opportunities.

In the northern portion of VCU 210, which has had no previous harvest, recreation activities and opportunities would shift from primitive to roaded under Alternative 6. The proposed road through this VCU would be connected to the Hoonah road system, and conventional roaded recreation use by ORVs, four-wheel drive vehicles, and motorbikes would be expected to occur in addition to the existing primitive activities. The roads constructed to access unit 151 would also provide access to False Bay.

In VCU 211, which has had no previous harvest, activities proposed under Alternative 6 would result in a shift of primitive recreation opportunities to more roaded ones. Although Alternative 6 proposes only one harvest unit in this VCU, new roads would make this VCU accessible from Hoonah, providing a new location for conventional roaded recreation activities already established along the Hoonah road system.

Alternative 6 proposes to harvest two units in the previously unentered northeastern end of VCU 213, as do Alternatives 4 and 5. Although different units are proposed under Alternative 6, the acreage is similar, as well as the effects on recreation resources. Alternative 6 would result in a shift of recreation opportunities from primitive to more modified; however, the magnitude of change would be greater than under Alternative 4 and 5 (See Table 4-24).

In VCU 217, the effect of activities proposed under Alternative 6 are similar to those that would occur under Alternatives 3, 4, and 5, described above.

Alternative 6 would have similar, but less effect on recreation opportunities and activities in VCU 219 as does Alternative 4 and 5.

## Visual Resources

The management activities proposed under the action alternatives may be visible to people from watercraft or aircraft. Impacts of the alternatives on visual resources were evaluated by comparing the changes in visual condition acreage that would result under each alternative. Changes in visual condition on Forest Service land for those VCUs affected by the alternatives are shown in Table 4-28. In addition, Forest Service land that would be visually affected by the alternatives were evaluated for their effect on the assigned Visual Quality Objectives (VQOs) presented in Chapter 3, Table 3-27. See the glossary for definitions of the visual condition classes and VQOs.

### Alternative 1

Eleven VCUs would be entered under Alternative 1. In three VCUs (209, 218, and 219) the assigned VQOs would change.

In VCUs 204, 208, 210, 212 through 215, and 217, the assigned VQOs would not change. Viewers could expect to see results of timber harvest activities in all these VCUs, which would appear as moderate contrasts in color and texture in the middleground.

In VCU 209, the visual impacts from past and proposed timber harvest would range from moderate to major intensity. Contrasts in color, line, and texture resulting from harvest would be easily noticed, and may even dominate the landscape when viewed from the small plane route over Chatham Strait. Visual evidence of harvest in the upper drainages of Suntaheen Creek, however, would be obscured from the small boat anchorage in Whitestone Harbor.

Table 4-28  
**Changes in Visual Condition in Acres<sup>1</sup>**

Visual Condition Classes <sup>2</sup> (Type)	Alternative					
	1	2	3	4	5	6
I	100,992	125,992	84,572	84,975	82,174	81,652
II	1,954	2,114	2,000	3,178	3,363	3,954
III	12,068	16,110	10,350	9,573	9,573	9,573
IV	75,931	52,857	78,170	56,168	76,865	85,530
V	18,268	12,140	34,121	55,319	37,238	28,504

SOURCE: Visual Resource Inventory for the Chatham Area, Tongass National Forest (Forest Service 1983b, 1984b).

<sup>1</sup> National Forest land.

<sup>2</sup> No Type VI Visual Condition Class occurs in Analysis Area 3.

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In VCU 218, timber harvest would dominate the landscape. The effects of the proposed harvest activity would be concentrated in the upper drainages of Wachusett Cove, visible in the middleground and background from marine travel routes in Freshwater Bay and Chatham Strait.

In VCU 219, proposed harvest units between East Point and Hill Point would result in visual impacts that would exceed the assigned partial retention VQO for that area. The remainder of the VCU, however, would remain predominantly natural appearing when viewed from Te-nakee Inlet.

### Alternative 2

Alternative 2 would enter six VCUs; 209, 210, 212, 214, 215, and 218. In four of these VCUs, the assigned VQOs would not change (VCUs 210, 212, 214, and 215); while in portions of VCUs 209 and 218, they would.

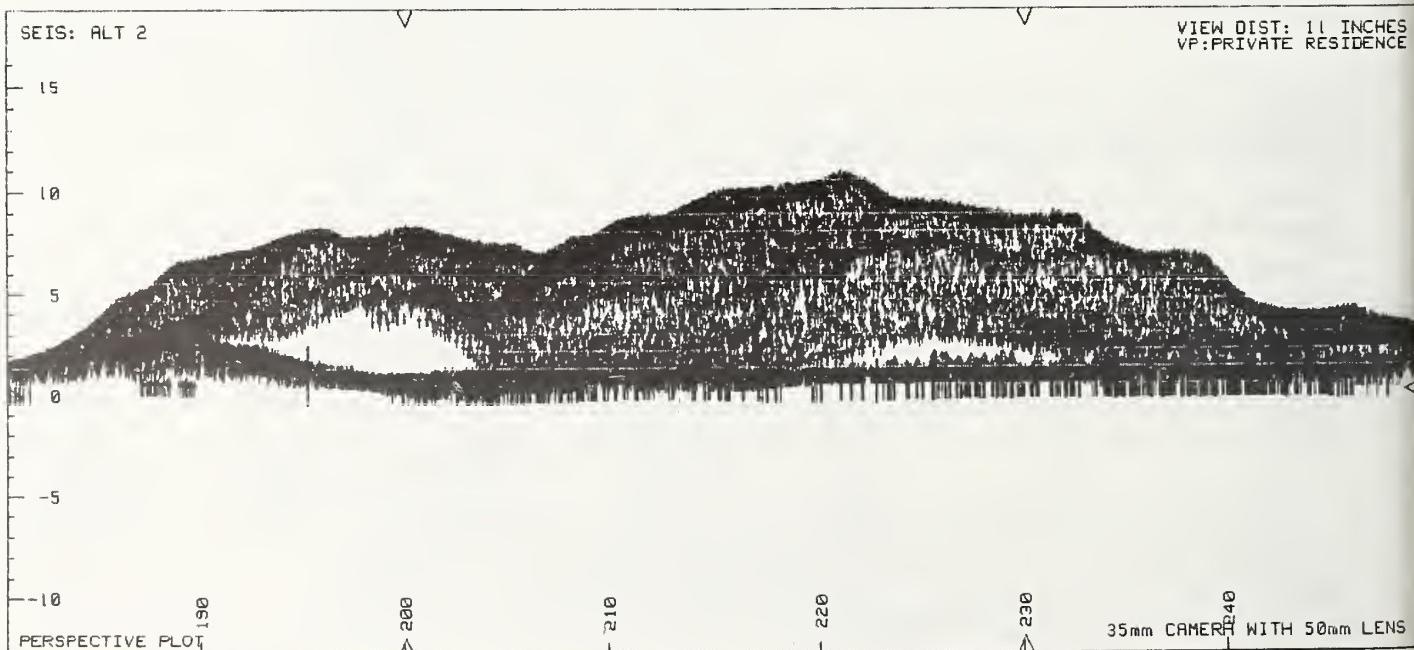
Because the units proposed for harvest in this alternative are a portion of those proposed under Alternative 1, visual effects would be similar, although less, than Alternative 1. Alternative 2 would harvest fewer acres near visually sensitive shoreline areas than Alternative 1, also reducing its visual effect. Results of timber harvest would appear as minor to moderate contrasts in color, line, and texture in middleground views of those VCUs that would not change the assigned VQOs. Visual impacts in VCUs 209 and 218 would be similar to those described for Alternative 1.

### Alternative 3

The timber harvest activities proposed under Alternative 1 would take place under Alternative 3, along with additional harvest in eight VCUs. The visual effects of Alternative 1, described above, should be added to the following effects of this alternative. Of the eight VCUs entered, visual changes in six would not change the assigned VQOs, while in two, they would.

Effects of timber harvest activities would not change the assigned VQOs in VCUs 203, 204, 208, 210, 212, and 217, where minor to moderate changes in color, line, and texture would result.

*Visual Perspective Plots Help  
Planners Evaluate Potential  
Impacts*



In VCU 209, Alternative 3 would harvest only 91 acres in addition to the 553 acres that would be harvested under Alternative 1, resulting in similar visual impacts. Harvest units would be visible from the small boat anchorage in Whitestone Harbor.

In VCU 218, Alternative 3 would harvest 547 acres in addition to the 273 harvested under Alternative 1. The additional units would be located in the upper Pavlof River drainage, where they would dominate the currently natural-appearing landscape. The concentration of units in this area would result in obvious color and texture changes in the middleground and background views from small boats and planes traveling in Freshwater Bay and Chatham Strait.

#### **Alternative 4**

Timber harvest activities proposed under Alternative 1 would also take place under Alternative 4, along with additional harvest in nine VCUs. The visual effects of Alternative 1 should be added to the following effects of this alternative. Six VCUs would not change the assigned VQOs and three would have portions that would change the assigned VQOs.

VCUs 210, 211, 212, 213, 215, and 217 would change the assigned VQOs. Viewers could expect to see timber harvest activities occurring in all these VCUs, however, visual impacts from color and texture contrasts would appear as minor to moderate disturbances when viewed from most middleground viewing distances. In all but one VCU, proposed timber harvest is located in areas where past timber management activities have dominated the visual field. In VCU 211, where the natural-appearing landscape prevails, proposed units would be visible as middleground from travel routes in Chatham Strait, however, they would not change the assigned modification VQO.

In VCUs 209 and 218, concentration of harvest units would result in visual impacts ranging from moderate to major. Color and texture changes, evidence of timber harvest activities, would dominate the view of the average forest visitor. In VCU 209, users of the popular small boat anchorages at Whitestone Harbor could expect to see strong visual contrast in their middleground and background views. In VCU 218, visual impacts would be very similar to those described for Alternative 3. When seen in the middle and background views from Freshwater Bay and Chatham Strait, the overall visual field would be one of intensive timber management.

In VCU 219, proposed harvest units together with previous 1986-90 harvest units would change the assigned partial retention VQO when viewed from travel routes in Tenakee Inlet. The proposed units would be partially obscured from views, but would still be more consistent with a modification VQO.

#### **Alternative 5**

Timber harvest activities proposed under Alternative 1 would also take place under Alternative 5, along with additional harvest in nine VCUs. The visual effects of Alternative 1 should be added to the following effects of this alternative. Six VCUs would not change the assigned VQOs, while three would.

VCUs 204, 210, 212, 213, 215, and 217 would change the assigned VQOs. Visual changes in these VCUs would be similar to those described in Alternatives 3 and 4.

Under Alternative 5, portions of VCUs 209, 218, and 219 would change the assigned VQOs. In VCUs 209 and 219, impacts would be the same as those described for Alternative 4. The effects of proposed harvest in VCU 218 would result in minor to moderate visual impacts, similar but less than under Alternative 4.

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### Alternative 6

Timber harvest activities proposed under Alternative 1 would also take place under Alternative 6, along with additional harvest in six VCUs. The visual effects of Alternative 1 should be added to the following effects of this alternative. Of these six VCUs, four would not change the assigned VQOs and two, VCU 213 and 219, would have portions that would change the assigned VQOs.

VCUs 204, 210, 211, and 217 would not change the assigned VQO. Visual changes in these VCUs would be similar to those described in Alternatives 3 and 4.

In VCU 213, the visual appearance of harvest units on the hillside facing Chatham Strait would result in changes to the assigned modification VQO. The majority of this VCU, however, would not change the assigned modification VQO. Iyouken Peninsula would not be harvested and would remain in its present natural-appearing condition.

In VCU 219, units along the Tenakee Inlet beach would present visual impacts more consistent with the modification VQO than the assigned partial retention VQO. Viewers from the Alaska Marine Highway and small boat route in Tenakee Inlet could expect to see results of timber harvest activities in the landscape.

### Cultural Resources

Cultural resource sites within the study area may contain important information on past environmental conditions and lifeways, including information related to environments and cultures along the northern Pacific Rim and possibly the interior of the North American continent. These sites are fragile and nonrenewable. Impacts can include disturbing or destroying structures, inappropriately altering their settings, or moving soils that contain archeological deposits.

Federal laws and regulations (particularly the National Historic Preservation Act of 1966, as amended; Executive Order 11593; and the American Indian Religious Freedom Act of 1978) require a process, outlined in 36 CFR Part 800, for considering the impacts of Federal projects on cultural resources. In brief, this process involves inventorying the resources, determining which are significant or eligible for inclusion in the National Register of Historic Places, evaluating project impacts, and designing and implementing measures to mitigate the adverse effects that projects may have upon significant resources. The process is undertaken in consultation with the State Historic Preservation Officer (SHPO).

In consultation with the SHPO, the Forest Service has developed a research design that will be applied to the selected alternative. This research design provides a method for evaluating topographic features within the VCUs according to their sensitivity or probability for containing cultural resources. The research design may specify the percentages of each probability category to be inventoried as well as the methods to be used for cultural resource surveys.

The alternatives under consideration are generally not expected to differ in their impacts on cultural resources. Before logging activities are undertaken in the selected alternative, Forest Service personnel will apply the research design to inventory cultural resources, evaluate their significance, determine potential project impacts, and design and implement necessary mitigation measures. Such measures could include relocating or redesigning some timber management activities to avoid disturbing cultural resources, protecting sites through the use of barriers, and recovering scientific data or otherwise documenting sites that cannot be avoided or protected. Mitigation measures would be designed to eliminate adverse project effects on significant cultural resources. The APC contract provides for enforcement of mitigating measures to avoid or minimize impacts on cultural resources.

The No Further Harvest (Alternative 2) would result in no further impacts on cultural resources from APC Long-Term Timber Sale activities through the balance of 1990. In addition to reducing site disturbance or destruction, the No Further Harvest Alternative would forego the beneficial effects of scientific study, interpretation, and appreciation of cultural resources.

Table 4-29 provides information on the amount of high probability areas within each VCU along with the amounts of these areas that might be impacted by the No Action-Current Direction Alternative and the action alternatives (Alternatives 3 through 6), and the numbers of known and potentially impacted cultural resources. Listed sites include Forest Service cabins, logging camps, contemporary cabins, and camp sites which might be considered cultural resources within the next 50 years.

## Employment Impacts

A primary reason for selling timber from the Tongass National Forest is to provide for economic development and community stability. The objectives of timber harvest result from specific guidelines furnished through legislation and historic direction related to employment, price stability, economic efficiency, foreign relations, small business, economic growth and development, community stability, and national security (Darr undated).

Since 1980, the Alaska National Interest Conservation Act (ANILCA) and the TLMP have furnished the direction for timber harvest. Section 705 of ANILCA provides funding to maintain a harvest level of 4.5 billion board feet per decade. Section 101(d) of ANILCA states the intent of Congress:

“This Act provides sufficient protection for the national interest in scenic, natural, cultural, and environmental values on the public lands in Alaska, and at the same time provides adequate opportunity for satisfaction of the economic and social needs of the State of Alaska and its people; accordingly, the designation and disposition of the public lands in Alaska pursuant to this Act are found to represent a proper balance between the preservation of national conservation system units and those public lands necessary and appropriate for

**Table 4-29**  
**Cultural Resource Impacts<sup>1</sup>**

VCU	Approximate Area of High Probability Zone	Known Cultural Resources	Cultural Resources In Area of Potential Impact
203	100	0	0
204	0	0	0
205	1,600	1	0
207	1,590	2	0
211	500	4	2
213	700	6	0
214	100	1	0
215	800	5	1
216	0	0	0
217	550	3	0
218	650	10	5
219	450	6	0
220	820	3	0
221	570	0	0
222	270	0	0
223	1,130	0	0

SOURCE: SEIS Planning Record.

<sup>1</sup> These impacts were originally evaluated under the 1986-90 FEIS and have been applied to the SEIS. Acreages are only approximate estimates.

## 4 Environmental Consequences

*Steve Brown was One of the Main Carvers of this Traditional Tlingit Canoe*



more intensive use and disposition, and thus Congress believes that the need for future legislation designating new conservation system units, new national conservation areas, or new national recreation areas, has been obviated thereby."

This section addresses the employment benefits that are derived from the harvest of timber on the Tongass National Forest and those that would be derived from the alternatives considered for Analysis Area 3 in this SEIS.

Based on a timber supply and demand report for Southeast Alaska (Forest Service 1989b) and estimates derived from the IPASS model (Olson, et al. 1984), Forest Service staff have calculated the average direct and indirect employment related to harvest volume from the Tongass National Forest. The figures include 8.5 jobs/MMBF/year direct and indirect employment. Each job was calculated to be worth an average of \$23,200. Table 4-30 shows the effects of each alternative in jobs and wages. Alternative 1 would maintain 334 jobs and almost \$7.9 million in salaries. Alternative 2 would harvest no timber in 1990 and therefore would produce no employment or income beyond 1990. Alternative 3 would maintain the most jobs

(1,570) and salaries (over \$36 million) based on the largest harvest volume. Alternatives 4, 5, and 6 would maintain fewer jobs and less salary value than Alternative 3 based on their lower harvest volumes.

Commercial recreation activity in Analysis Area 3 includes guided brown bear and deer hunting. Brown bear and deer carrying capacity may be lowered by harvest through the end of the APC Contract, potentially causing outfitters to be displaced. The already lower habitat capability and increased competition between subsistence and sport hunters in this Analysis Area has necessitated the establishment of lower bag limits and shorter seasons for deer hunting, and will likely lead to road closures as well (see the Wildlife and Subsistence Sections for further discussion of these issues). These actions could have an effect on outfitters. When an outfitter goes out of business, a negative impact results.

As was mentioned earlier in this chapter, potential impacts on fishery resources are minimal because of the site specific AHMU prescriptions being applied along fish streams and the relatively small amount of fish habitat adjacent to harvest units. Because of this, none of the alternatives are expected to have any affect on income or employment opportunities in the sport or commercial fishing industries or any related economic sectors.

## Economic Impacts

This section addresses the major components of the costs to the industry of harvesting the timber. This evaluation of costs and benefits provides one basis for comparing the alternatives.

The costs of harvesting timber and converting it into marketable forest products are comprised primarily of harvest costs, transportation costs, and manufacturing costs. Those components discussed below are those that can vary from one alternative to another.

Timber harvest cost estimates are based on the Region 10 Timber Appraisal Handbook (Forest Service 1986e). Base Year 1986 appraisal costs adjusted to the quarter ending June 1988 were used to analyze the SEIS alternatives. These estimates represent costs an "operator of average efficiency" would be expected to incur. Several factors affect appraisal costs, including species mixture, log grade, net volume/acre, logs/MBF, yarding distance, woods and scal-

Table 4-30  
**Jobs and Wages Maintained for Each Alternative**

	1	2	3 <sup>1</sup>	4 <sup>1</sup>	5 <sup>1</sup>	6 <sup>1</sup>
<b>1989</b>						
Volume of Harvest (MMBF)	63.3	63.3	63.3	63.3	63.3	63.3
Jobs Maintained	538	538	538	538	538	538
Value from Wages (Million\$)	12.5	12.5	12.5	12.5	12.5	12.5
<b>1990</b>						
Volume of Harvest (MMBF)	29.9	0	121.4	97.1	96.9	79.0
Jobs Maintained	254	0	1032	825	824	672
Value from Wages (Million\$)	5.9	5.9	29.8	25.1	25.0	21.5
Total Costs by Alternative	44.7	26.7	33.0	23.8	23.7	25.5
Total 1990 Costs <sup>3</sup>	18.0	0	51.0	41.8	41.7	43.5

SOURCE: Timber Supply and Demand, Draft 1988 Report (Forest Service 1989b).

<sup>1</sup> The costs of each action alternative (Alternatives 3 - 6) should be added to the cost of the 1990 harvest of the No Action/Current Direction Alternative (Alternative 1) because both would occur.

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### APC Pulp Plant, Sitka Alaska



ing defect, and percent sideslope. Of these factors, species mixture, log grades, and logs/MMBF have the greatest effect on harvesting costs.

The harvest costs for each of the action alternatives are displayed in Table 4-28. Harvest costs shown for Alternatives 3 through 6 are costs in addition to those that would be incurred under Alternative 1. Alternative 3 would have the highest total harvesting costs. Alternative 6 would have the lowest total cost followed by Alternatives 4 and 5.

The manufacturing costs (Table 4-31) depend primarily on the total board feet, the species mixture, and the log grade and size. For this analysis, the assumption was used that the species mixture and log grade and size would be the same for all alternatives, since that information only becomes available later in the harvest process. Manufacturing costs shown for Alternatives 3 through 6 are in addition to the costs that would be incurred under Alternative 1.

The transportation costs for each alternative are presented in Table 4-32. Alternative 6 would result in the least total transportation costs because it would construct the least amount of road and make available the least amount of timber. Alternative 3 would result in the highest total transportation cost with Alternatives 4 and 5 being intermediate.

The three major variables affecting road construction costs are terrain, road standard, and the number of bridges required. Experience has shown that roads constructed in similar terrain will have costs that are similar. Higher road standards may affect road construction costs by requiring wider roads with flatter grades designed to reduce haul costs. Bridges are relatively expensive and contribute heavily to road construction costs. Alternative 3 has the highest unit cost per mile for road construction because it constructs the highest number of road miles per MMBF.

Road maintenance costs are derived from the amount of timber being hauled on the road as well as the standard to which the road is constructed. The higher the road standard, the lower the maintenance costs. Alternative 3 has the lowest road maintenance costs per MBF because of the large proportion of higher standards of road miles.

Log haul costs are a product of the amount of timber hauled, the distance hauled, and the condition and standard of the haul route. Alternative 3 has the lowest land (truck) haul unit costs per MBF because it has the shortest distance hauled for the amount of timber made available. Alternative 6 has the highest truck haul costs.

Water tow costs are a product of the amount of timber towed and the distance it is towed, along with the fixed costs of dumping, rafting, and raft storage. Alternative 6 has a slightly

Table 4-31

### Timber Harvest and Manufacturing Costs in Millions of Dollars<sup>1</sup>

	Alternative					
	1	2 <sup>2</sup>	3	4	5	6
Total Harvest Cost	14.2	8.5	10.5	8.1	8.0	15.1
Manufacturing Cost	30.5	18.2	22.5	15.7	15.7	10.4
Total Costs by Alternative	44.7	26.7	33.0	23.8	23.7	25.5
Total 1990 Costs <sup>3</sup>	18.0	0	51.0	41.8	41.7	43.5

SOURCE: Timber Appraisal Handbook, FSH 2409.22 (Forest Service 1986a).

<sup>1</sup> Costs to an Operator of Average Efficiency.

<sup>2</sup> These costs apply to all the alternatives in 1989.

<sup>3</sup> The costs of each action alternative are added to the cost of the 1990 harvest of the no action/current direction alternative because both would occur.

higher cost per MBF because of the higher percentage of timber volume transferred through Long Island and the longer tow distance from Long Island to Sitka.

The unit costs (dollars per MBF) for the action alternatives are given in Table 4-33. When harvest, transportation, and manufacturing costs are considered together, Alternative 3 has the lowest total cost per MBF. Alternatives 4 and 6 have similar, intermediate costs, and Alternative 5 has the highest total costs.

**Table 4-32  
Transportation Costs**

Item	Alternative <sup>1</sup>					
	1	2	3	4	5	6
Miles of Road Construction <sup>2</sup>	36.4	21.1	32.5	32.7	35.2	19.8
Thousand Board Feet <sup>2</sup>	106,029	63,334	78,253	54,415	54,249	36,267
Road Construction Cost/Mile <sup>2</sup>	178,000	178,000	188,413	145,731	166,353	175,734
<i>Costs</i>						
Road Construction	6,867,460	3,980,900	6,452,393	5,149,650	6,253,834	3,792,720
Road Maintenance	761,660	455,000	562,158	416,885	405,144	316,558
Log Truck Haul	1,416,700	846,200	1,045,637	825,027	769,136	563,364
Water Tow	1,825,460	1,090,400	1,347,322	864,410	904,194	636,018
Log Transfer Facility	0	0	0	0	0	0
Total	10,871,280	6,372,500	9,407,510	7,255,972	8,332,308	5,308,660

SOURCE: Engineers Guide for Estimating Costs of Survey, Design, and Construction of Roads and Bridges, USDA Forest Service, Region 10, Juneau, AK. December 1, 1988.

<sup>1</sup> The reader should note that a selected action alternative and the No Action/Current Direction Alternative would occur together. Therefore, the costs for Alternative 1 should be added to the costs for each action alternative to understand the total cost of transportation.

<sup>2</sup> These values were used to calculate the transportation costs shown.

**Table 4-33  
Unit Costs (\$ per MMBF) for Harvest, Transportation, and Manufacturing**

	Alternative					
	1	2	3	4	5	6
Harvest Volume (MMBF) <sup>1</sup>	106.0	63.3	184.7	160.4	160.2	142.3
<i>Costs</i>						
Unit Harvest	134.31	134.31	134.32	148.90	147.99	139.83
Unit Transportation	104.82	102.91	122.53	135.79	155.98	149.10
Unit Manufacturing	287.85	287.80	287.80	287.80	287.80	287.80
Total	526.98	525.02	544.65	572.49	591.77	576.73

SOURCE: Timber Appraisal Handbook, FSH 2409.22 (Forest Service 1986e). Engineers Guide for Estimating Costs of Survey, Design, and Construction of Roads and Bridges. USDA Forest Service, Region 10, Juneau, AK. December 1988.

<sup>1</sup> These values were used to calculate the unit costs shown.

### Reasonably Foreseeable, Long-Term, and Cumulative Effects

This section of Chapter 4 addresses the reasonably foreseeable, long-term, and cumulative effects of the alternatives on the environment of Analysis Area 3. Long-term management on the forest is dependent upon the direction contained in the Tongass Land Management Plan (TLMP). The TLMP is revised every 10 to 15 years, and is currently being revised. The long-term projections contained in the 1986-90 FEIS and in this document, assume that current management direction on the forest will continue for the next 90 to 100 years. However, the TLMP will be revised six to ten times in the next 90 to 100 years. Decisions made during the revision process can provide for significant changes in management emphasis in any given portion of the National Forest. More reasonable is that the Forest Service will continue to comply with its responsibilities under the APC long-term contract. Therefore, the Supplement contains analysis of data to 2011, the end of the contract, and tiers to the 2080 projections made in the 1986-90 FEIS.

*Building a Log Raft Requires Skill and Teamwork*

Cumulative effects include the effects of past harvest, existing harvest, future harvest, adjacent harvest, and harvest proposed under the SEIS alternatives, as well as reasonably foreseeable impacts. The effects associated with predicted harvest on adjacent private lands is included in the analysis of reasonably foreseeable long-term effects.



*Indian River Watershed*

Future harvest projections on National Forest lands were developed using the Multi-Entry Layout Process (MELP) analysis according to the Alaska Regional Guide pages 3-21 and 3-22 (Forest Service 1983a). The MELP documentation used for the 1986-90 FEIS has been updated as a primary data source for this document and is part of the planning record. The MELP identifies the commercial forest land, logging systems, and road networks required to manage the timber resources of each VCU in Land Use Designation (LUD) III and LUD IV categories. It also considers high hazard soil conditions, fisheries and wildlife habitat management objectives, and management objectives relating to visual and other resources. In addition, timber harvest markets and potentially uneconomical timber stands were considered. Forest Service planners projected harvest on private lands to continue at present rates until such time as the initial entry is completed (see Assumptions section of this chapter).

The long-term and cumulative effects analysis tiers to the Tongass Land Management Plan (Forest Service 1979a), the TLMP amendment (Forest Service 1986b), and to the FEIS for the 1986-90 Operating Period of the Alaska Pulp Corporation Long-Term Sale Area. It also incorporates information from a Life of Sale Plan for the APC contract prepared in 1982 (Forest Service 1982). The decisions made in TLMP provide long range direction for management of the Tongass National Forest for the duration of that plan.

The Life of Sale Plan uses the timber output scheduled in TLMP to project the volume range to be harvested in each Operating Period through the end of the APC Contract, the year 2011. The MELP does not schedule specific activities within the life of the APC Contract, but projects the TLMP direction through the life of the APC Contract to establish an end baseline for estimating reasonably foreseeable effects. The alternatives considered in this SEIS present various site-specific means of achieving part of the schedule developed in the Life of Sale Plan (Forest Service 1982). The reasonably foreseeable, long-term, and cumulative effects do not depend on the alternatives presented in this SEIS. Rather, they are what may be expected under the current direction planned in TLMP, the Life of Sale Plan, and projected by the

## 4 Environmental Consequences

MELP. The reasonably foreseeable, long-term, and cumulative effects would occur under any of the action alternatives until such time as TLMP is revised.

In the Memorandum and Order from *Tenakee Springs v. Courtright*, the Court indicated that “the EIS should consider, to the extent of foreseeability, the cumulative impacts on the natural environment of a steadily expanding network of logging roads and cutting units.” For the purposes of this document, reasonably foreseeable effects are defined as those effects that can be predicted to occur assuming all APC contractual commitments are met by the year 2011.

### Assumptions

The following assumptions were used to assess the reasonably foreseeable effects to the end of the APC Contract. These assumptions reflect current management/technology of National Forests and provide a uniform approach to estimating effects of timber harvest and road construction. Following the assumptions, the reasonably foreseeable, long-term, and cumulative effects on each resource category are discussed. The discussions may supplement and/or summarize the material presented in 1986-90 FEIS (Forest Service 1986b).

#### A. National Forest lands:

- The geographical items in the MELP data base are:
  1. the locations of National Forest System land projected for potential harvest in the future (operable CFL),
  2. the locations of National Forest System land projected for potential harvest over an extended rotation,
  3. the locations of National Forest System land projected to remain for wildlife,
  4. the locations of National Forest System land that is expected to be economically inefficient to harvest under a timber harvest scheduling scenario that would approximate the TLMP guidelines. Decisions have not been made addressing the exact site specific placement of resource objectives.
- There will be three entries into the commercial forest land without an extended rotation
- Four entries into LUD IV extended rotation areas are planned over a 120-year period.
- Six entries into LUD III extended rotation areas are planned over a 120- period.
- All main corridor roads would be built during the life of the APC contract. Forest roads accessing commercial forest land to be harvested would be built on first entry.
- Laws, Guidelines, and Best Management Practices for resource protection would be followed. These requirements are expected to be at least as stringent in the future as they are today.
- Timber sale planning would occur in an interdisciplinary fashion.
- Second-growth stands within deer winter range would be managed to provide cover and forage.
- All harvest units would be clearcut.
- All acres of operable commercial forest land are equally subject to impacts.
- The No Action Alternative would represent only a delay in implementing the TLMP and, therefore, would have no foreseeable, long-term effects.

**B. Native Ownership - Harvest Assumptions**

- Initial entry will be completed by 2011 and is assumed to be 90 percent of the standard operable acres.
- State laws and regulations governing forest practices would be met.
- Transportation systems to timber harvest units would be based on highlead logging system capability.
- Highlead operable acres are equivalent to acres categorized as standard operable.
- All harvest units would be clearcut.
- Standard operable acres are based on the Tongass Land Management Plan aerial photo points data.
- Long-term projections indicate that the Indian River LTF may be needed to access timber resources in VCUs 216, 219, and 220 and may be constructed by the year 2011.

**Vegetation/Timber**

The following discussion of reasonably foreseeable, long-term, and cumulative impacts on forest vegetation draws from and supplements pages 4-230 to 4-234 in the APC 1986-90 FEIS. No further analysis has been conducted since the APC 1986-90 FEIS on long-term and cumulative effects of harvest on second-growth timber or the forest products market for second-growth timber. Discussions of the vegetative changes expected to occur through time on harvested acres, as well as the operable CFL that would remain, effects on mature and over-mature timber stands, and effects of timber harvest from private lands are provided below. The discussion of the vegetative changes through time is especially important since it provides the basis for long term effects on most other resources.

**Plant Successional Changes Following Harvest**

In areas where harvest occurs, active management will replace natural succession of forest stands. All of the areas proposed for harvest in this SEIS are expected to be managed as even-aged stands. After clearcutting, stands will be restocked within five years, either by managed natural regeneration or by replanting. Where necessary, precommercial thinning will be done by the twentieth year after harvest. Overall, stands will be managed on a 100-year rotation, with the exception of some LUD III and IV lands managed on extended rotations to 160 years and 120 years, respectively.

After replanting, managed forests grow through several distinctive successional stages. Different components dominate the stand at different stages, and the overall forest structure changes over time as well.

In the first five years of reforestation, the young forest receives maximum sunlight, which results in the rapid establishment of a variety of shrubs, forbs, and grasses. There is little incidence of damage or mortality from disease or infestation at this stage. The changed structure of the young forest affects the structure of adjacent stands; windthrow increases with greater wind exposure, and understory development accelerates due to increased light into the stand.

In years 5 to 20, seedlings grow into a vigorous young forest of trees averaging about 19 feet in height and one to three inches diameter at breast height (DBH). Understory production is at its highest at this stage, especially in blueberry-dominated sites. Larger dead materials from the original stand begin to decompose, and the forest edge stabilizes, resulting in less windthrow.

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At the end of this successional stage, the forest may be precommercially thinned, leaving a species composition of about 60 percent western hemlock, 40 percent Sitka spruce, and less than 2 percent cedar.

At an age of 20 to 50 years, tree growth is very rapid, with a gain of about one foot in height per year, and diameter growth of more than five inches every 10 years. Tree crowns begin to grow closer together, while the understory changes from a dense shrub, herb, and seedling-dominated structure to one of dense moss. Stands which have been precommercially thinned will have a two-layered canopy, with hemlock in the lower story. Canopy closure will occur more slowly in precommercially thinned sites.

In years 50 to 80, the canopy remains closed. Little sunlight reaches the forest floor, and the understory continues to be dominated by moss. Tree diameter growth slows to about one inch every ten years, as competition between trees increases. It is not currently economically feasible to precommercially thin stands at this age, but precommercial thinning would increase understory growth and diversity, and would also result in greater tree diameter growth.

In years 80 to 100, the forest becomes mature. Some trees may die, while others become clearly dominant in size. Diameter growth slows to less than one inch every ten years. Moss continues to dominate the understory, except in places where the canopy has opened and allowed sufficient light for herbaceous plants. These structural characteristics continue into the later stages of the stand (100 to 160 years), with continued slow growth and occasional openings in the canopy.

This description does not apply strictly to all sites at all times. Characteristics such as height, diameter, and productivity vary between sites of different quality, or "site classes". However, these successional characteristics would be generally applicable to all units harvested in the Analysis Area. Table 4-34 summarizes the general successional characteristics of managed forest by site class (low, medium, and high site).

Alternative 5 would convert the largest amount of forest land to managed condition, followed by Alternatives 6 and 7. Alternative 7 would convert the highest number of VCUs, followed by Alternative 5. Proposed harvest by site class for all of the alternatives in Analysis Area 3 is displayed in Table 4-8, at the beginning of this chapter.

### **Projected Timber Harvest through 2011**

The Multi-Entry Layout Process (MELP) was used to project reasonably foreseeable road development and harvest in the Life of Sale Plan. The purpose of the 2011 projected harvest is to provide information by which to analyze long-term and cumulative effects, rather than to begin planning the harvest units. Actual harvest units through 2011 would be laid out and analyzed for site-specific impacts in five-year or other suitable planning periods. Projected harvest of Native land within Analysis Area 3 was estimated to include approximately 90 percent of the normal operable CFL by 2011 (based on data collected in the TLMP aerial photo points inventory and as it existed prior to Native land conveyance).

Table 4-35 shows the amount of harvest being projected from Forest Service and private lands. The data show that 25.2 percent of the commercial forest acres on National Forest land in Analysis Area 3 would be harvested by 2011. This amount of harvest would affect, on average, 12.1 percent of the total National Forest land base in the Analysis Area. When private harvest projections are added to National Forest harvest in VCUs 204 through 208, 219, and 220, the percent CFL expected to be harvested ranges from 17.1 in VCU 219 to 90 percent in VCU 206, which is all private land. This assumed harvest level would affect 6.8 to 76.0 percent of the entire land base in those VCUs and 17.3 percent of Analysis Area 3.

The volume available for harvest in the Life of Sale Plan was based on the TLMP aerial photo point inventory data. Stand examinations conducted for MELP recorded more acreage of Volume Classes 6 and 7 than the TLMP aerial photo point inventory suggesting that more

Table 4-34

**Average Structural Characteristics of Managed Stands by Site Classification**

Stand Age (years)	Height (feet)	DBH (inches)	Volume/Acre (board feet)
<i>Low Site</i>			
5-20	19	1.3	— <sup>1</sup>
20-50	50	5.1	— <sup>1</sup>
50-80	74	7.9	9925
80-100	88	9.6	21500
100-120	100	11.2	35700
120-160	122	14.2	60200
<i>Medium Site</i>			
5-20	19	2.1	— <sup>1</sup>
20-50	59	8.2	— <sup>1</sup>
50-80	93	11.7	24000
80-100	109	13.5	43500
100-120	121	14.9	59500
120-160	137	17.5	82000
<i>High Site</i>			
5-20	19	2.7	— <sup>1</sup>
20-50	72	9.5	— <sup>1</sup>
50-80	107	13.2	42500
80-100	123	15.1	63200
100-120	134	16.8	77100
120-160	151	19.7	102395

Source: SEIS Planning Record.

<sup>1</sup> Average volume data not available for stands of 5 to 50 years.

volume may be present on the acreage scheduled for harvest by the Life of Sale Plan. When TLMP is revised this question will be further addressed.

#### Mature and Overmature Timber

All timber on National Forest lands proposed for harvest in the action alternatives are mature or overmature and are well beyond the point of culmination of the age of maximum average annual growth of the stand. They are representative of uneven-aged western hemlock stands that commonly take hundreds of years to develop under natural conditions if they are not manipulated by intensive forest management practices or changed by natural events such as windthrow.

The environmental consequences of converting mature and overmature forest stands to an earlier successional stage involves many complex interactions, including many ecological changes that affect physical, biological, and social systems. These successional changes are difficult to quantify because of the complexity of forest succession, the amount of site and stand variability, the difficulty of quantifying social values resulting from change, and the lack of intensive research about forest succession in Southeast Alaska.

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Table 4-35  
Foreseeable and Long-Term Timber Harvest by 2011

VCU	Cumulative Harvest (acres)	Percent Operable CFL	Percent CFL <sup>1</sup>	Percent Land <sup>1</sup>
<i>National Forest Land</i>				
203	1,185	32.8	31.9	10.8
204	2,754	28.3	24.1	9.7
205	0	0	0	0
207	0	0	0	0
208	413	21.7	20.6	6.4
209	2,601	46.6	40.4	19.7
210	2,419	35.9	34.9	19.1
211	517	19.7	17.4	11.0
212	1,987	34.0	28.6	14.9
213	375	13.2	13.2	9.8
214	900	36.7	30.6	13.1
215	2,847	27.8	24.6	12.2
216	1,118	29.9	28.2	10.4
217	1,786	29.4	27.5	17.5
218	3,096	33.2	32.8	16.3
219	650	17.1	17.1	10.9
220	1,783	21.2	20.9	10.1
221	627	28.6	24.9	13.3
Subtotal	25,058	27.5	25.2	12.1
<i>Native Corporation Land</i>				
204	2,034	89.8	78.3	31.6
205	2,488	90.0	77.9	31.9
206	3,701	90.0	90.0	76.0
207	7,978	90.0	87.3	73.6
208	35	26.5	26.5	26.5
Subtotal	16,236	89.5	84.7	54.0
<i>Tenakee Springs and State of Alaska land</i>				
219	80	17.2	17.2	10.9
220	448	32.2	31.8	15.3
221	0	0	0	0
Subtotal	528	25.8	25.3	13.0
Total	41,822	37.6	34.6	17.3

SOURCE: Multi-Entry Layout Plan database, Chatham Area Supervisor's Office, Sitka, AK.

<sup>1</sup> Percent CFL and percent land calculations based on the TLMP data.



The reasonably foreseeable and long-term effects of the timber harvest made available under ANILCA will be the conversion of over half of the commercial forest land to second-growth stands. This is less than half of all forest lands in Analysis Area 3.

### Second-Growth Stands

The open conditions created in clearcuts allow both Sitka spruce and western hemlock to regenerate rapidly. Even-aged stands usually contain from 10 to 75 percent spruce depending on the soil type and the age of the stand. On average, the volume of spruce in even-aged stands 75 to 100 years after harvest is about 50 percent (Taylor 1934) compared to 28 percent in existing mature and overmature stands. With the use of silvicultural practices such as pre-commercial thinning, an additional 10 percent or more increase in the spruce component is expected.

Although log quality in second-growth stands is expected to be lower than in mature and overmature stands, even on sites that have been precommercially thinned, total yield per acre is expected to be higher in second-growth stands. The lower quality will be reflected in the log grades (sizes), with second-growth timber stands having fewer higher grade logs than existing mature and overmature stands. In addition, second-growth stands will have less volume in the larger diameter classes. Nevertheless, total yield per acre will be significantly greater in second-growth stands than in mature and overmature stands. The long-term results of precommercial thinning is the production of more useable fiber. Precommercial thinning also allows the Forest Service the option of reducing the rotation age because merchantable size logs are produced sooner on thinned sites than in areas not thinned.

Most second-growth stands will exhibit less variation in tree diameter and height than the mature and overmature stands they replace. For unmanaged second-growth stands average diameters will range from 10.5 inches on the poorer sites (site index 85) to 17.2 inches on the best sites at 100 years of age (site index 140) (Taylor 1934). With several precommercial thinnings it is possible to produce average stand diameters that approximate old-growth averages. On the better sites average diameters of 20 to 21 inches are possible in 100 to 110 years (Forest Service 1986c).

## Transportation

Through the end of the APC Long-Term Contract in year 2011, there are four log transfer facilities expected to be used in conjunction with Analysis Area 3 Forest Service operations. They are the existing Long Island LTF (continuous use expected) and Kennel Creek LTF (continuous), the Seal Creek LTF (intermittent), which will be built under the No Further Harvest and Current Direction Alternatives, and the False Bay LTF (intermittent), which is assumed to be constructed in all of the action alternatives. The Indian River LTF, which long-term projections indicate may be needed to access timber resources in VCUs 216, 219, and 220, may be constructed by the year 2011. The logging camps at Long Island and Kennel Creek would continue to be used. Their use is expected to be continuous as at present.

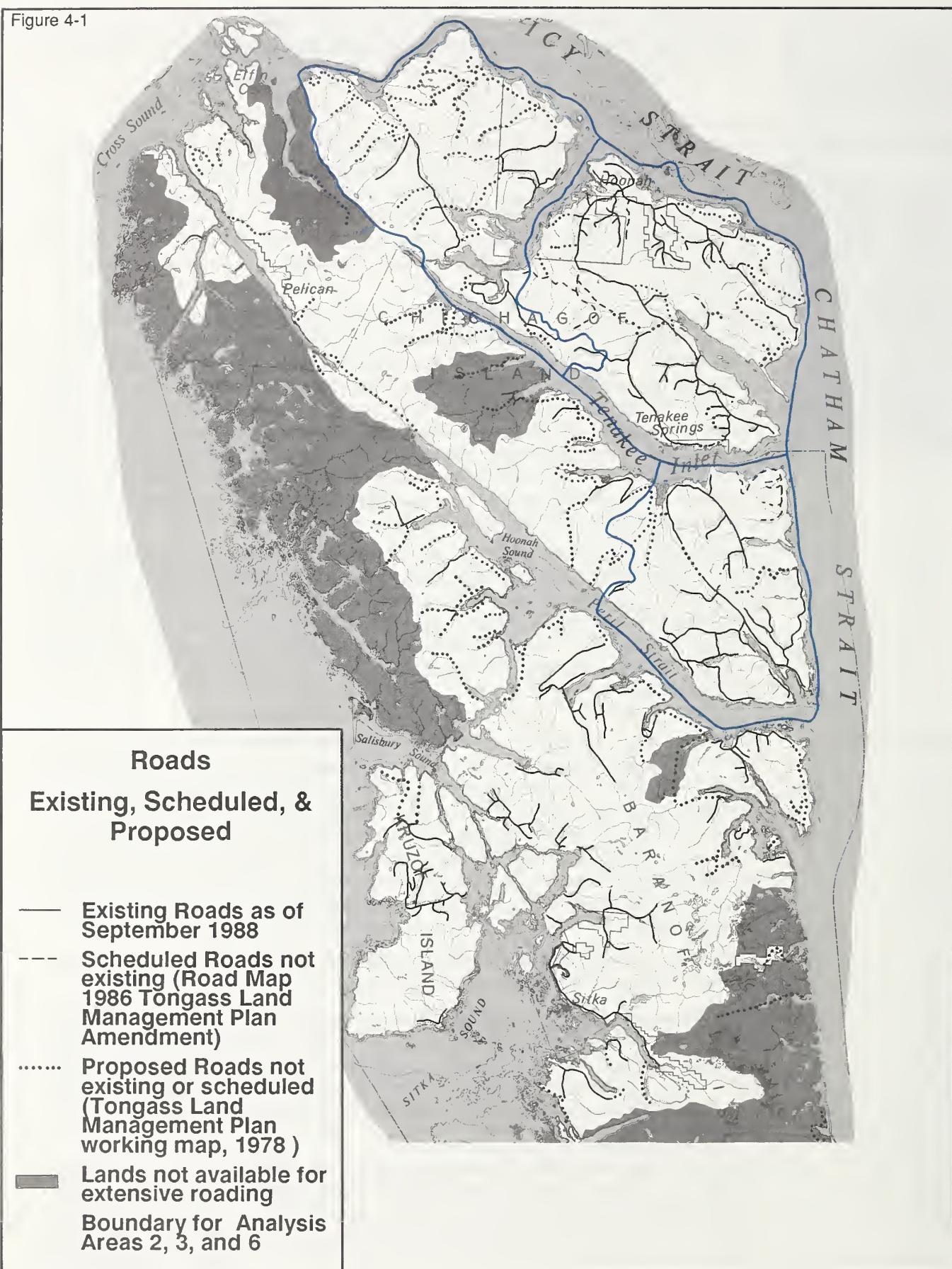
Forest roads are classified in relation to their service life as either short-term (10 years or less design life) or as long-term (20 years and greater).

Short-term roads are developed and operated for a limited time period and cease to exist as a transportation facility after the purpose for which they were constructed is completed. When the use of these roads has ended, they are obliterated and reclaimed for natural resource management and for erosion control. The timber purchaser is responsible for obliteration, which may be accomplished through natural revegetation. These roads are not included in the forest development road inventory.

Long-term or forest development roads are developed and operated for long-term land management and resource utilization needs. They are constructed either under the terms of the timber sale contract or under a formal road construction contract. All the tables, charts and graphs in this document that display road miles feature only these forest development roads. Figure 4-1 is a 1978 view of a long term transportation system for the Tongass National For-

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Figure 4-1



est. This long term projection was updated for scheduled roads during the 1985-86 TLMP Amendment. The 1978 projected system may appear to be nonresponsive to current issues such as a road connecting Hoonah to Tenakee Springs (H. R. 987). This EIS and ROD for projects such as this Supplement provide the responsible official an opportunity to address current transportation issues.

The environmental consequences from forest development roads can be compared in terms of road density and acres of forest removed from natural resource production by roadway clearing widths. Road density is defined by the number of miles of forest development road in a square mile. Generally, the higher the road density, the higher the risk of environmental impacts. Road density environmental impact risks are minimized and mitigated by standards and guidelines which direct the road location, design, construction and operation. Tables 4-36 and 4-37 display current road densities, projected road densities by alternative and road densities through the foreseeable future for each VCU in Analysis Area 3.

The clearing widths required for forest road development are dictated by the steepness of the terrain and the road design standard. Steeper terrain with high design standards generally require wider clearing limits resulting in a greater number of acres cleared. Clearing limits can be modified, within the limits of driver safety, when the road parallels fish streams and beaches. Table 4-38 compares road clearing acres in each VCU by alternative.

Table 4-36

### **Proposed Road Construction and Road Density**

VCU	Existing <sup>1</sup>	Alternative					
		1	2	3	4	5	6
<i>Miles of Road</i>							
203	0	0	0	5.7	0	0	0
204	15.8	0	0	17.5	0	10.1	5.9
205	13.0	0	0	0	0	0	0
206	13.5	0	0	0	0	0	0
207	20.5	0	0	0	0	0	0
208	4.5	0	0	0	0	0	0
209	19.5	0.9	0	3.1	2.5	2.9	0
210	21.8	6.2	0	3.2	7.8	7.4	8.9
211	0	0	0	0	2.6	0	1.0
212	7.7	9.7	0	0.3	0.9	1.1	0
213	1.0	2.0	0	0	2.9	3.2	1.7
214	7.1	0	0	0	0	0	0
215	15.9	1.6	0	0	4.3	3.3	0
216	7.9	0	0	0	0	0	0
217	9.1	0.3	0	0.5	1.4	1.1	0.5
218	28.0	0	0	2.2	2.3	2.5	0
219	1.8	1.4	0	0	3.6	3.6	1.8
220	12.5	0	0	0	0	0	0
221	0	0	0	0	0	0	0
Total	132.2	22.1	0	32.5	28.3	35.2	19.8

(Continued)

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Table 4-36 (Continued)  
Proposed Road Construction and Road Density

VCU	Existing <sup>1</sup>	Alternative					
		1	2	3	4	5	6
<i>Road Density<sup>2</sup></i>							
203	0	0	0	0.33	0	0	0
204	0.29	0	0	0.32	0	0.18	0.11
205	0.73	0	0	0	0	0	0
206	1.38	0	0	0	0	0	0
207	1.18	0	0	0	0	0	0
208	0.44	0	0	0	0	0	0
209	0.95	0.04	0	0.15	0.12	0.14	0
210	1.11	0.31	0	0.16	0.40	0.38	0.45
211	0	0	0	0	0.36	0	0.14
212	0.71	0.90	0	0.03	0.08	0.10	0
213	0.17	0.33	0	0	0.48	0.53	0.28
214	0.66	0	0	0	0	0	0
215	0.44	0.04	0	0	0.12	0.09	0
216	0.47	0	0	0	0	0	0
217	0.57	0.02	0	0.03	0.09	0.07	0.03
218	0.95	0	0	0.07	0.08	0.08	0
219	0.15	0.12	0	0	0.30	0.30	0.15
220	0.44	0	0	0	0	0	0
221	0	0	0	0	0	0	0
Total	0.53	0.09	0	0.13	0.11	0.14	0.08

SOURCE: SEIS Planning Record

<sup>1</sup> Existing Road miles included roads authorized by the Alaska Federal District Court in the non-deferred VCU's.

<sup>2</sup> Road density is defined as the miles of road per square mile.

Table 4-37

**Projected Road Construction (Miles) and Road Density  
Through 2011**

VCU	Existing Roads <sup>1</sup>	Projected New Construction	Total Projected Roads	Road Density
203	0	9.0	9.0	0.53
204 <sup>2</sup>	15.8	43.5	59.3	0.79
205 <sup>2</sup>	13.0	6.5	19.5	1.10
206 <sup>2</sup>	13.5	1.5	15.0	1.53
207 <sup>2</sup>	20.5	5.0	25.5	1.47
208	4.5	9.9	14.4	0.96
209	19.5	34.9	54.4	1.69
210	21.8	45.1	66.9	2.29
211	0	10.7	10.7	1.47
212	7.7	24.9	32.6	2.31
213	1.0	4.5	5.5	0.75
214	7.1	11.1	18.2	1.04
215	15.9	28.4	44.3	0.78
216	7.9	13.4	21.3	1.27
217	9.1	17.0	26.1	1.06
218	28.0	43.4	71.4	1.47
219	1.8	6.3	8.1	0.52
220	12.5	2.9	15.4	0.55
221	0	0	0	0

SOURCE: SEIS Planning Record.

<sup>1</sup> Road miles existing as of September 1, 1988.

<sup>2</sup> Road miles in Native Selections included.

## 4 Environmental Consequences

Table 4-38  
Clearing Requirements For Road Development (Acres)

VCU	Alternative					
	1	2	3	4	5	6
203	0	0	36	0	0	0
204	0	0	110	0	64	37
205	0	0	0	0	0	0
206	0	0	0	0	0	0
207	0	0	0	0	0	0
208	0	0	0	0	0	0
209	6	0	20	16	18	0
210	39	0	20	49	47	56
211	0	0	0	16	0	6
212	61	0	2	6	7	0
213	13	0	0	18	20	11
214	0	0	0	0	0	0
215	10	0	0	27	21	0
216	0	0	0	0	0	0
217	2	0	3	9	7	3
218	0	0	14	14	16	0
219	9	0	0	23	23	11
220	0	0	0	0	0	0
221	0	0	0	0	0	0
Total	140	0	205	178	223	124

SOURCE: SEIS Planning Record

### Wildlife

Although the proposed alternatives would have no major effect on wildlife, there may be potential long-term effects. Once new roads have been constructed into a previously unharvested watershed, there is likely to be pressure to continue their use in the future. The resulting activity could reduce wildlife populations or wildlife use of the habitats due to additional access for hunters, pressure to use the watershed for recreation activities, and re-entry for timber harvesting. Road management options, described in the mitigation section below, could restrict road use and reduce these effects if they are implemented over the long term.

The primary long-term impacts on wildlife result from changes in habitats. Therefore, the reasonably foreseeable effects to the end of the APC Long-Term Timber Sale (year 2011) were estimated by calculating the acres of each VCU that would be harvested up to that date. Amounts of habitat projected to be harvested were used to evaluate effects on emphasis species.

The location and amount of timber harvest acreage and the resulting effect on wildlife habitats were projected for the 100-year rotation ending in the year 2080 in the 1986-90 FEIS (Forest Service 1986b, page 4-247). For this supplemental analysis, reasonably foreseeable effects were calculated until the end of the long-term timber sale (2011). Consequently, the effects on wildlife habitats were proportionally reduced from the estimates presented in the 1986-90 FEIS. This method was used because the precise location of the timber harvest within the VCUs to the end of the sale has not been determined. The estimated acreage and percent of unaffected wildlife habitat remaining after timber harvest activities through 2011 are displayed in Table 4-39. Forested habitat information on the National Forest, Tenakee

Table 4-39

**Acres of Wildlife Habitat Remaining After Projected Harvest Through 2011**

VCU	Forested	Deer Winter Range	Inland Wetland	Beach Fringe	Estuarine Fringe	Streamside Riparian
<i>National Forest Land</i>						
203	7,709	565	— <sup>1</sup>	211	268	250
204	22,272	940	— <sup>1</sup>	594	226	900
205	3,401	— <sup>1</sup>	— <sup>1</sup>	— <sup>1</sup>	— <sup>1</sup>	— <sup>1</sup>
207	8,057	— <sup>1</sup>	25	— <sup>1</sup>	— <sup>1</sup>	300
208	5,153	600	13	502	— <sup>1</sup>	— <sup>1</sup>
209	7,344	1,007	— <sup>1</sup>	459	402	500
210	8,245	1,865	— <sup>1</sup>	659	146	595
211	3,485	600	— <sup>1</sup>	540	— <sup>1</sup>	— <sup>1</sup>
212	7,767	568	24	232	90	310
213	2,591	1,284	38	1,080	— <sup>1</sup>	30
214	2,918	202	— <sup>1</sup>	100	85	40
215	15,823	1,900	30	760	781	550
216	6,796	— <sup>1</sup>	— <sup>1</sup>	— <sup>1</sup>	— <sup>1</sup>	— <sup>1</sup>
217	7,028	1,200	— <sup>1</sup>	470	46	250
218	11,976	1,010	130	530	552	820
219	4,295	920	— <sup>1</sup>	340	— <sup>1</sup>	18
220	9,170	— <sup>1</sup>	21	— <sup>1</sup>	270	1,500
221	3,069	1,000	15	590	— <sup>1</sup>	50
Subtotal	137,099	13,661	296	7,067	2,866	6,113
<i>Native Corporation Land</i>						
204	2,722					
205	3,576					
206	749					
207	2,155					
208	97					
Subtotal	9,299					
<i>Tenakee Springs and State of Alaska Land</i>						
219	526					
220	1,499					
221	337					
Subtotal	2,362					
Total	148,760					

(Continued)

## 4 Environmental Consequences

Table 4-39 (Continued)

### Percent of Wildlife Habitat Remaining After Projected Harvest Through 2011

VCU	Forested	Deer Winter Range	Inland Wetland	Beach Fringe	Estuarine Fringe	Streamside Riparian
<i>National Forest Land</i>						
203	87	80	— <sup>1</sup>	71	100	80
204	87	86	— <sup>1</sup>	88	95	46
205	100	— <sup>1</sup>	— <sup>1</sup>	— <sup>1</sup>	— <sup>1</sup>	— <sup>1</sup>
207	100	— <sup>1</sup>	100	— <sup>1</sup>	— <sup>1</sup>	100
208	93	94	100	100	— <sup>1</sup>	— <sup>1</sup>
209	67	82	— <sup>1</sup>	69	99	71
210	77	95	— <sup>1</sup>	99	97	84
211	87	80	— <sup>1</sup>	96	— <sup>1</sup>	— <sup>1</sup>
212	80	74	100	91	100	76
213	87	91	100	99	— <sup>1</sup>	39
214	76	79	— <sup>1</sup>	92	99	51
215	85	72	94	91	95	78
216	100	— <sup>1</sup>	— <sup>1</sup>	— <sup>1</sup>	— <sup>1</sup>	— <sup>1</sup>
217	80	87	— <sup>1</sup>	98	94	55
218	79	76	81	95	100	89
219	87	83	— <sup>1</sup>	81	— <sup>1</sup>	36
220	78	— <sup>1</sup>	100	— <sup>1</sup>	100	88
221	78	86	100	89	— <sup>1</sup>	55
Subtotal <sup>2</sup>	84	83	90	91	98	72
<i>Native Corporation Land</i>						
204	57					
205	59					
206	17					
207	21					
208	73					
Subtotal <sup>3</sup>	36					
<i>Tenakee Springs and State of Alaska Land</i>						
219	87					
220	77					
221	100					
Subtotal <sup>4</sup>	82					
Total <sup>5</sup>	77					

SOURCE: SEIS Planning Record.

<sup>1</sup> None of this habitat was found in the inventory.

<sup>2</sup> This value represents the percent of pre-harvest habitat remaining in the analysis area on National Forest land.

<sup>3</sup> This value represents the percent of pre-harvest habitat remaining in the analysis area on Native Corporation land.

<sup>4</sup> This value represents the percent of pre-harvest habitat remaining in the analysis area on Tenakee Springs and State of Alaska land.

<sup>5</sup> This value represents the percent of pre-harvest habitat remaining in the entire analysis area.



Springs, and Native Corporation lands is included to provide a basis for the evaluation of impacts over the entire analysis area. Emphasis habitat acres on Tenakee Springs and Native Corporation lands are not included because similar inventory data or the precise location of harvest units is not available.

### Wildlife Habitats

It is estimated that 77 percent of the forested habitat in Analysis Area 3 would remain unaffected by timber harvest activities on National Forest (84 percent), Tenakee Springs, and Native Corporation lands through 2011 (Table 4-39). The percent of unaffected forest habitat remaining by VCU on National Forest land varies from 67 percent in VCU 209 to 100 percent in VCUs 205, 207, and 216. On the Tenakee Springs and Native Corporation lands, the percent of unaffected forest habitat varies from 17 percent in VCU 206 to 100 percent in VCU 221. The 23 percent of forested habitat affected in the entire analysis area would be in various stages of forest succession following timber harvest. These areas would provide varying wildlife habitat values as the forest matures. Timber harvest increases the number of forage areas and forage production due to sprouting vegetation. However, this would be a temporary condition because the forest canopy closes with increased tree growth. As the canopy closes and matures, the hiding and thermal cover values increase. Precommercial thinning helps to balance the forage and cover values. In varying degrees, changing habitat values, due to forest succession, will affect the habitats and species discussed below.

### Deer Winter Range

Implementation of the Analysis Area 3 alternatives will reduce deer winter range from a low of 87 acres in Alternative 2 to a high of 426 acres in Alternative 6. Acres of deer winter range remaining following the 1990 Operating Period would range from 86 percent under Alternative 6 to 91 percent under Alternative 2. (See Tables 4-11 and 4-12 for VCU-specific information).

It is estimated that 83 percent of the deer winter range in Analysis Area 3 would remain unaffected by timber harvest activities through 2011 (Table 4-39). The percent of unaffected deer winter range remaining by VCU varies from 72 percent in VCU 215 to 94 percent in VCU 208. The affected 17 percent would undergo forest succession and the associated changes in habitat values as mentioned above.

### Inland Wetland

No inland wetlands are proposed for harvesting under any of the alternatives. Ninety percent of inland wetlands in Analysis Area 3 would remain after the end of the Operating Period.

An estimated 90 percent of the inland wetland habitat in Analysis Area 3 would remain unaffected by timber harvest activities through 2011 (Table 4-39). The percent of unaffected inland wetland habitat remaining by VCU varies from 81 percent in VCU 218 to 100 percent in six VCUs.

### Beach Fringe

Implementation of the Analysis Area 3 alternatives would reduce beach fringe habitat by a low of 20 acres in Alternative 2 to a high of 233 acres in Alternative 6. Alternatives 4 and 5 would not result in impacts to beach fringe habitat. At the end of the Operating Period, 90 to 93 percent of the Analysis Area's beach fringe habitat would remain (see Table 4-14).

Ninety-one percent of the beach fringe habitat in Analysis Area 3 is estimated to remain unaffected by timber harvest activities through 2011 (Table 4-39). The percent of unaffected beach fringe habitat remaining by VCU varies from 69 percent in VCU 217 to 100 percent in four VCUs.

## **4 Environmental Consequences**

### **Estuarine Fringe**

No estuarine fringe habitat is proposed for harvest in Analysis Area 3.

It is estimated that 98 percent of the estuarine fringe habitat in Analysis Area 3 would remain unaffected by timber harvest activities through 2011 (Table 4-39). The percent of unaffected estuarine fringe habitat remaining by VCU varies from 94 percent in VCU 217 to 100 percent in four VCUs.

### **Streamside Riparian**

A small amount of streamside riparian habitat would be affected by implementation of the alternatives, ranging from a low of 3 acres under Alternative 4 to 179 acres under Alternative 1. At the end of the Operating Period, 90 to 92 percent of streamside riparian habitat would remain (See Tables 4-15 and 4-16).

It is estimated that 72 percent of the streamside riparian habitat in Analysis Area 3 would remain unaffected by timber harvest activities through 2011 (Table 4-39). The percent of unaffected streamside riparian habitat remaining by VCU varies from 36 percent in VCU 219 to 100 percent in VCU 207.

### **Old-Growth Conditions**

The greatest impact to old-growth habitat would occur under Alternative 6, with 548 acres, or 4 percent, harvested. Alternative 4 follows, with a proposed old-growth habitat harvest of 296 acres, or 2 percent. Alternative 5 would impact 153 acres, or one percent, and Alternative 3, 73 acres, or 0.5 percent. Neither Alternatives 1 or 2 recommend the placement of any units in old-growth habitat. At the end of the Operating Period, 96 percent of old-growth habitat would remain in Alternative 6; 99 percent under Alternative 5; 98 percent under Alternative 4; and 99.5 percent under Alternative 3. (See Table 4-17).

## **Wildlife Species**

### **Sitka Black-tailed Deer**

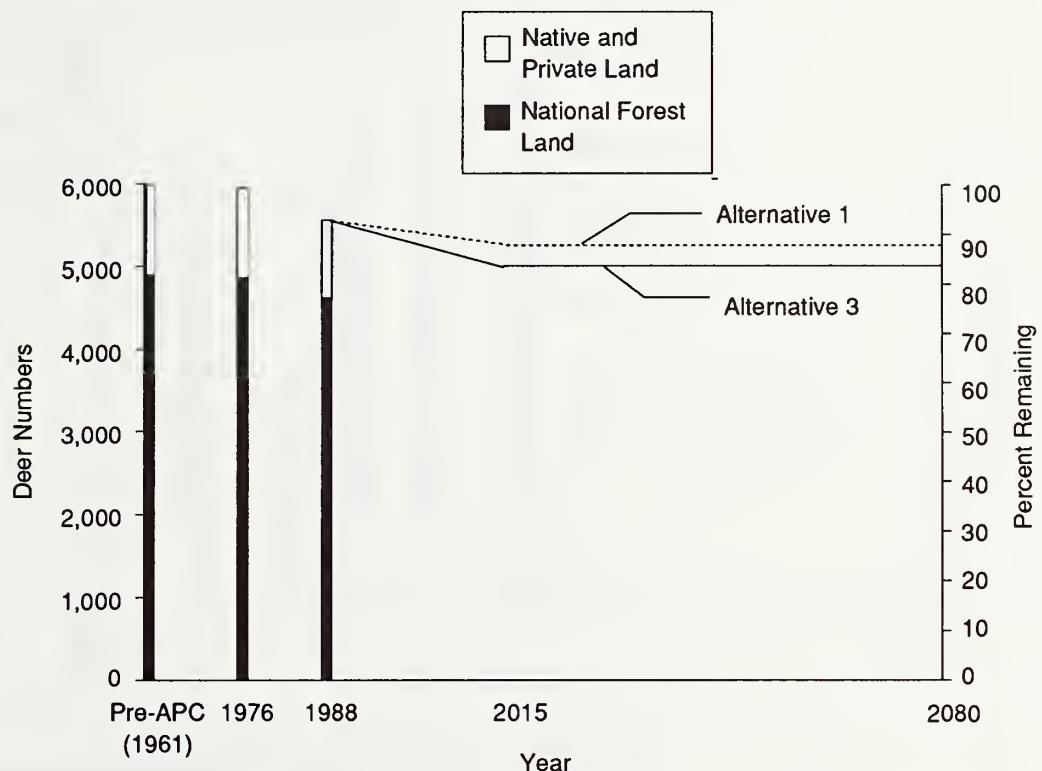
It is estimated that 77 percent of the forested habitat (84 percent on National Forest land) and 83 percent of deer winter range would remain unaffected by timber harvest activities through 2011 (Table 4-39). The resulting change in those habitats would probably lead to a reduced carrying capacity for the black-tailed deer. (See Consolidated Appendix, Volume II, C-3, Theme Response 9 on data adequacy and models used.)

Due to second growth closing in past clearcut areas, Alternative 1 would result in potential deer numbers on National Forest land being reduced to 90 percent of the 1961 level by 2015 (Figure 4-2). By 2080, no further reductions are expected from second growth development and therefore would result in a potential population also at 90 percent of the 1961 level. It should be noted that Figure 4-2 includes the effects due to harvest activities through 1988 on Native Corporation lands. If the effects of these harvest activities were also considered, the projected habitat capability over the entire analysis area would be reduced to 88 percent of the 1961 level by 2015 and 88 percent by 2080.

Alternative 3 proposes the most timber harvest in Analysis Area 3 and is projected to result in the greatest impact on deer habitat capability. Proposed timber harvest activities and second growth closure effects are projected to result in potential deer numbers on National Forest land at 85 percent of the 1961 level by 2015 and 85 percent by 2080. Alternative 3 in Figure 4-2 also includes the same timber harvest level on Native Corporation lands as discussed above in Alternative 1. Deer population levels over the entire analysis area would be at 83 percent of the 1961 level by 2015 and 83 percent by 2080.

Figure 4-2

**Project Specific Effects on Potential Black-tailed Deer Habitat Capability Through One Timber Crop Rotation**



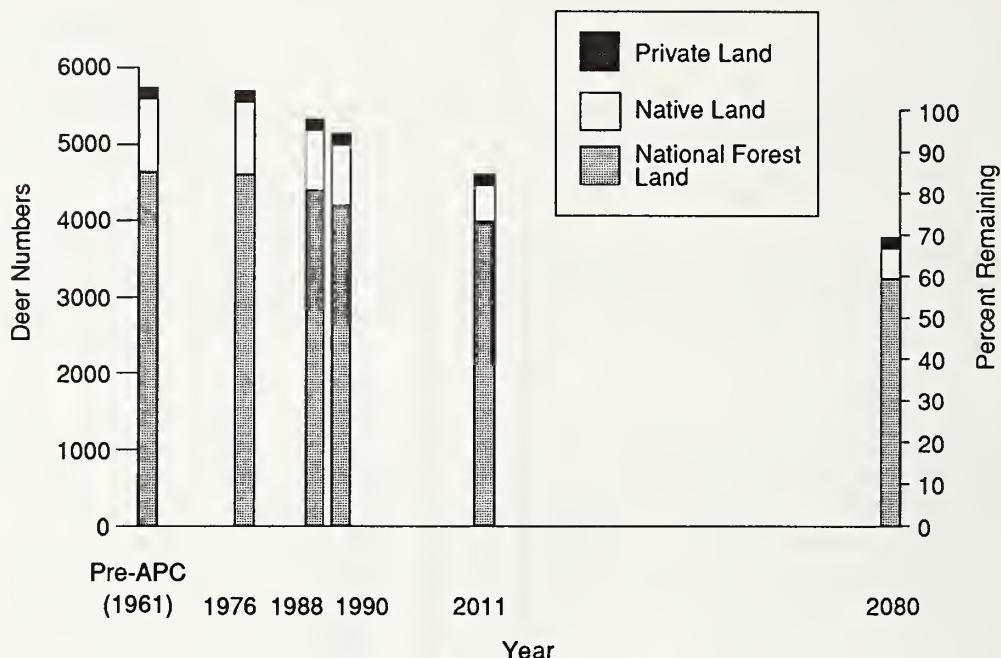
SOURCE: Forest Service in consultation with ADF&G (SEIS Planning Record).

The habitat capability model information projects that long-term timber harvest effects on both National Forest and Native Corporation lands would reduce potential deer numbers (Figure 4-3). By 2011, the habitat on Native Corporation land is estimated to support 49 percent of the 1961 potential deer population and 42 percent by 2080. On National Forest land, deer habitat capability by 2011 is estimated at 86 percent of the 1961 level, and 70 percent by 2080. No timber harvest has occurred since 1961 or is proposed in the future on Tenakee Springs and State of Alaska lands. The deer habitat capability on these lands should remain at 100 percent of the 1961 level to 2011 and 2080. Timber harvest effects on deer habitat over the entire analysis area (all land ownership) would result in a habitat capability at 80 percent of the 1961 population by 2011 and 66 percent by 2080.

#### Brown Bear

Timber harvest effects on the brown bear are not expected to be substantial. Their high use of streamside riparian, estuarine fringe, and beach fringe habitats indicate the importance of these areas to brown bears. The levels of harvest should give a relative indication of the cumulative effects on these animals. It is estimated that after the projected harvest by 2011 these habitats would remain at 72 to 98 percent of the original amounts in most VCUs (Table 4-39).

**Figure 4-3  
Comparison of Potential Black-tailed Deer Habitat Capability Through One Timber Crop Rotation<sup>1</sup>**



SOURCE: Forest Service in consultation with ADF&G (SEIS Planning Record).

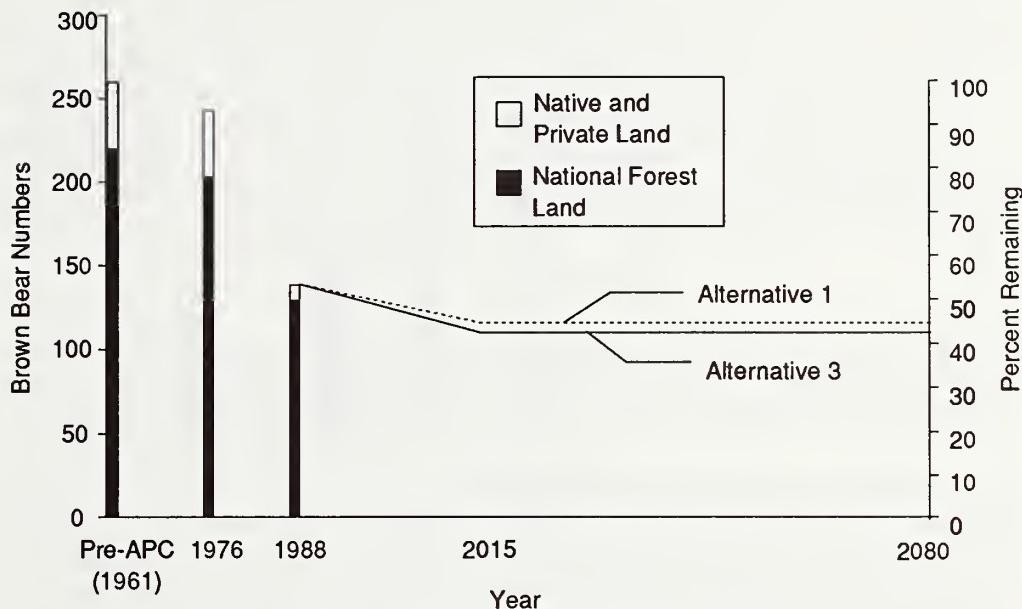
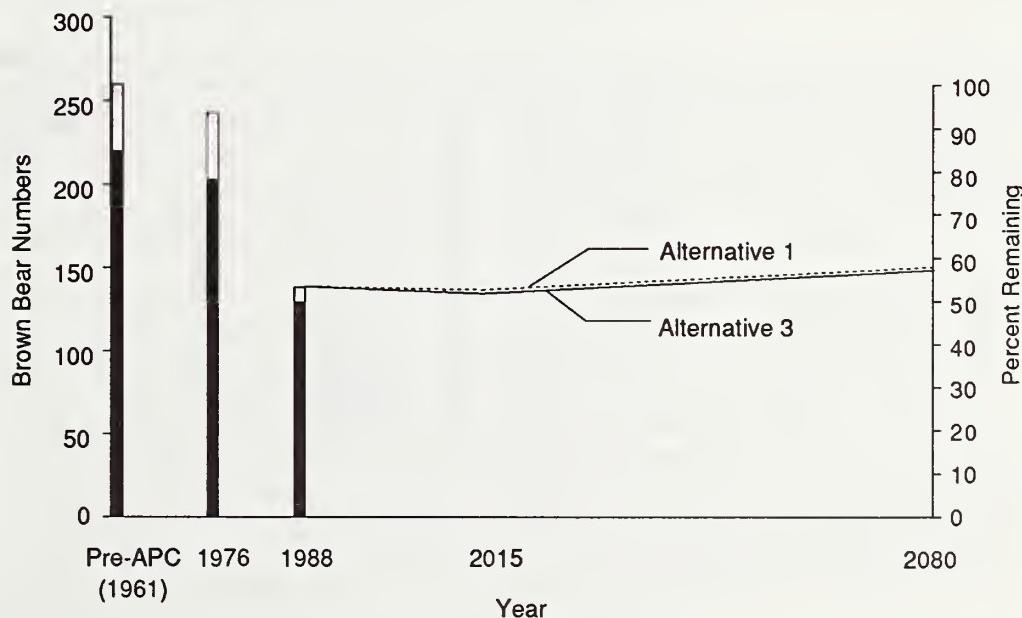
1 Includes effects due to projected harvest under MELP and TLMP.

Due to second growth closing in past clearcut areas and road density levels, Alternative 1 is projected to result in potential brown bear numbers on National Forest land being reduced to 49 percent of the 1961 level by 2015 (Figure 4-4). No additional reduction in numbers is expected and the population level should remain stable to 2080. It should be noted that Figure 4-4 includes the effects due to harvest activities through 1988 on Native Corporation lands. If the effects of these harvest activities were also considered, the projected habitat capability over the entire analysis area is projected to be reduced to 45 percent of the 1961 level by 2015 and remain at that level to 2080. (See Consolidated Appendix, Volume II, C-3, Theme Response 9 on data adequacy and models used.)

Alternative 3 proposes the most timber harvest in Analysis Area 3 and is projected to result in the greatest impact on brown bear habitat capability. Proposed timber harvest activities, second growth closure effects, and open roads are projected to result in potential brown bear numbers on National Forest land at 46 percent of the 1961 level by 2015 and the same to 2080. Alternative 3 in Figure 4-4 also includes the same timber harvest level on Native Corporation lands as discussed above in Alternative 1. Brown bear population levels over the entire analysis area would be at 42 percent of the 1961 level by 2015 and the same to 2080.

The habitat capability model information projects that long-term timber harvest effects on both National Forest and Native Corporation lands would reduce estimated brown bear numbers (Figure 4-5). By 2011, the habitat on Native Corporation land is estimated to support 15 percent of the 1961 potential brown bear population and 15 percent by 2080. On National Forest land, brown bear habitat capability by 2011 is estimated at 44 percent of the 1961 level, and 35 percent by 2080. Timber harvest effects on brown bear habitat over the entire

Figure 4-4

**Project Specific Effects on Potential Brown Bear Habitat Capability Through One Timber Crop Rotation****Without Road Management Options****With Road Management Options**

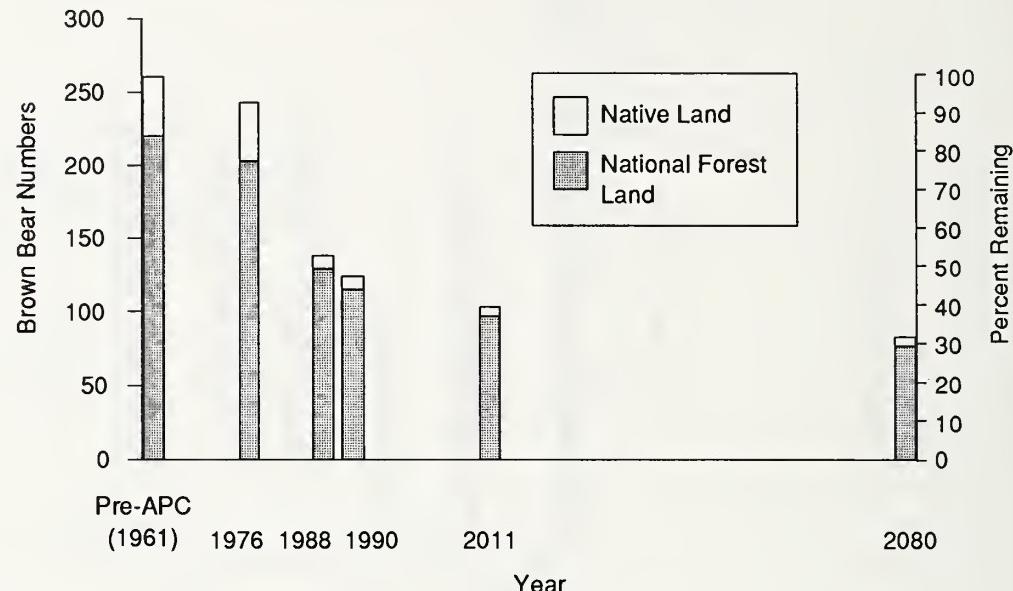
SOURCE: Forest Service in consultation with ADF&amp;G (SEIS Planning Record).

## 4 Environmental Consequences

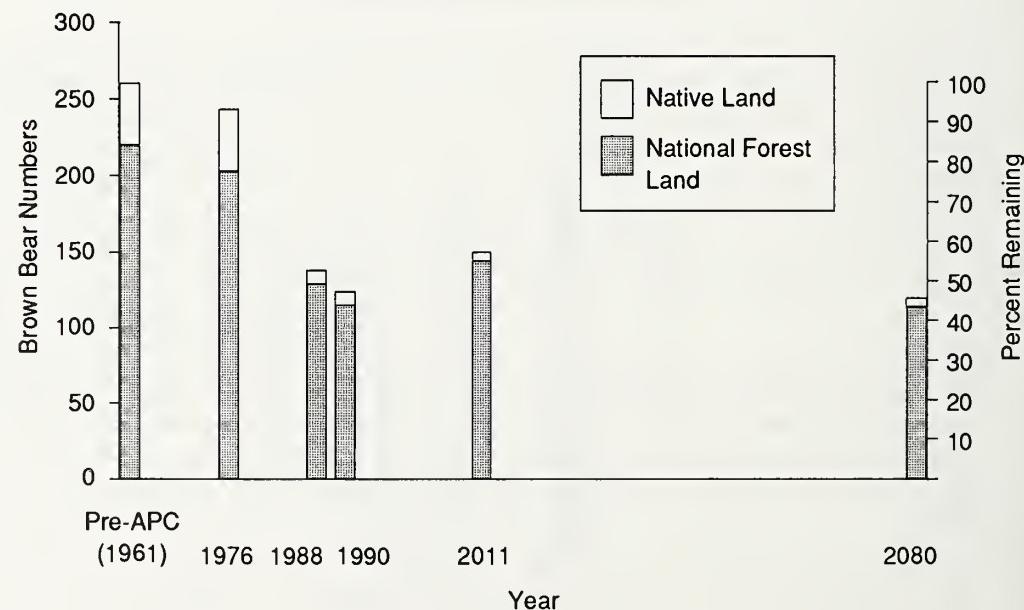
Figure 4-5

### Comparison of Potential Brown Bear Habitat Capability Through One Timber Crop Rotation<sup>1</sup>

#### Without Road Management Options



#### With Road Management Options



SOURCE: Forest Service in consultation with ADF&G (SEIS Planning Record).

<sup>1</sup> Includes effects due to projected harvest under MELP and TLMP.

analysis area (all land ownership) would result in a habitat capability at 40 percent of the 1961 population by 2011 and 32 percent by 2080.

If any road closure management options were implemented as discussed in the Mitigation section of Chapter 4, brown bear habitat capability numbers would show long-term improvement on National Forest land. Figure 4-5 illustrates the positive change on brown bear numbers resulting from the proposed road management options. As noted in the earlier impacts discussion, reduction of brown bear kills would be immediately realized due to closure of newly constructed roads. For those roads already constructed and providing access to back country areas, the positive effect of road closure would take more time. The lower illustration (Figure 4-5) that shows brown bear numbers under the road closure options, indicates this long-term positive effect by 2011 and further on to 2080. A summary of road access mitigation options is below in the Mitigation Section of this chapter (Table 4-48) and a more detailed breakdown can be found in Appendix C-2 of the Phase II Draft SEIS for Analysis Area 3. Other mitigation measures include the use of incinerators as provided for in the APC Contract, training and education programs for logging and construction operators and their personnel, and ADF&G hunting regulations.

#### Pine Marten

It is estimated that over 77 percent of the forested habitat (84 percent on National Forest land) would remain unaffected by timber harvest activities through 2011 (Table 4-39). The habitat reduction associated with timber harvest would probably lead to a proportional reduction in carrying capacity for the pine marten.

Due to second growth closing in past clearcut areas and road density levels, Alternative 1 is projected to result in potential pine marten numbers on National Forest land being reduced to 48 percent of the 1961 level by 2015 (Figure 4-6). No additional reduction in numbers is expected and the population level should remain stable to 2080. It should be noted, that Figure 4-6 includes the effects due to harvest activities through 1988 on Native Corporation lands. If the effects of these harvest activities were also considered, the potential habitat capability over the entire analysis area would be reduced to 44 percent of the 1961 level by 2015 and remain at that level to 2080. (See Consolidated Appendix, Volume II, C-3, Theme Response 9 on data adequacy and models used.)

Alternative 3 proposes the most timber harvest in Analysis Area 3 and would result in the greatest impact on pine marten habitat capability. Proposed timber harvest activities, second growth closure effects, and open roads are projected to result in potential pine marten numbers on National Forest land at 44 percent of the 1961 level by 2015 and the same to 2080. Alternative 3 in Figure 4-6 also includes the same timber harvest level on Native Corporation lands as discussed above in Alternative 1. Pine marten population levels over the entire analysis area would be at 40 percent of the 1961 level by 2015 and the same to 2080.

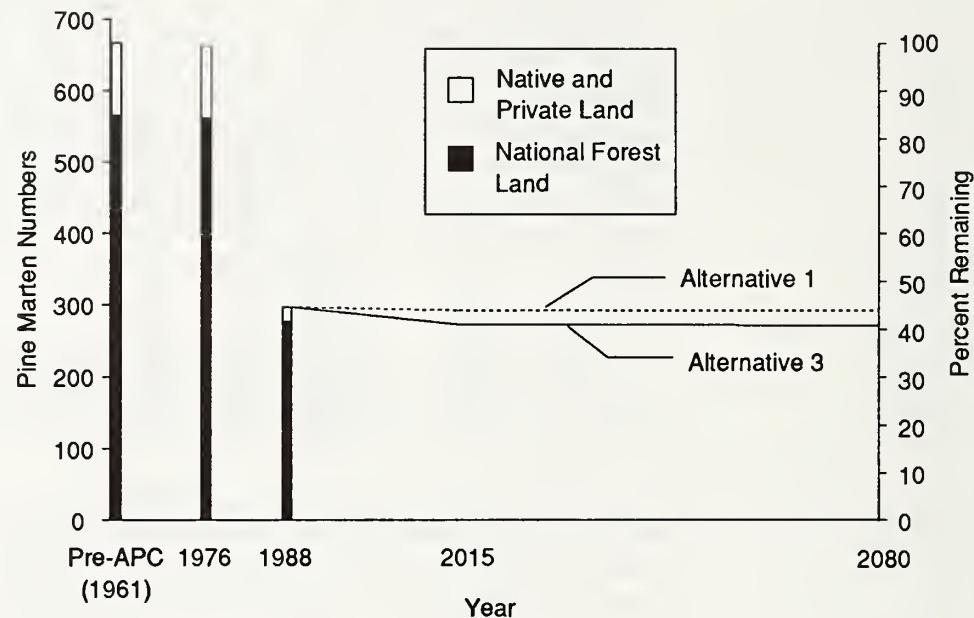
The habitat capability model information indicates that long-term timber harvest effects on both National Forest and Native Corporation lands would reduce potential pine marten numbers (Figure 4-7). By 2011, the habitat on Native Corporation land is estimated to support 40 percent of the 1961 potential pine marten population and 36 percent by 2080. On National Forest land, pine marten habitat capability by 2011 is estimated at 88 percent of the 1961 level, and 52 percent by 2080. No timber harvest has occurred since 1961 or is proposed in the future on Tenakee Springs and State of Alaska lands. The pine marten habitat capability on these lands should remain at 100 percent of the 1961 level to 2011 and 2080. Timber harvest effects on pine marten habitat over the entire analysis area (all land ownership) would result in a habitat capability at 80 percent of the 1961 population by 2011 and 50 percent by 2080.

Carrying capacity for the marten should increase again as regenerated forests in harvest units mature through the rotation. However, it is not expected that a stand will return to the carry-

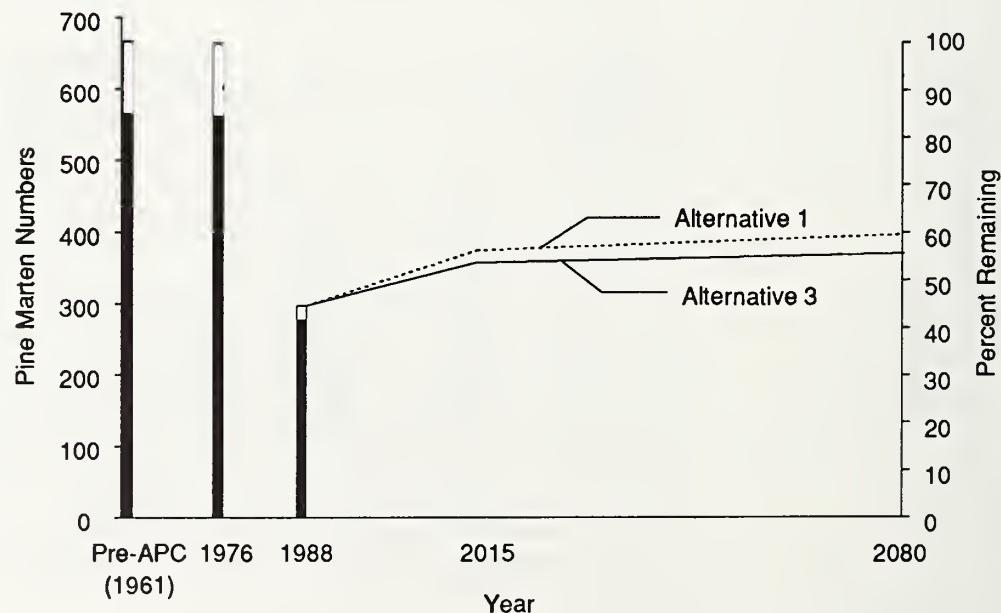
## 4 Environmental Consequences

Figure 4-6  
Project Specific Effects on Potential Pine Marten Habitat Capability Through One Timber Crop Rotation

### Without Road Management Options

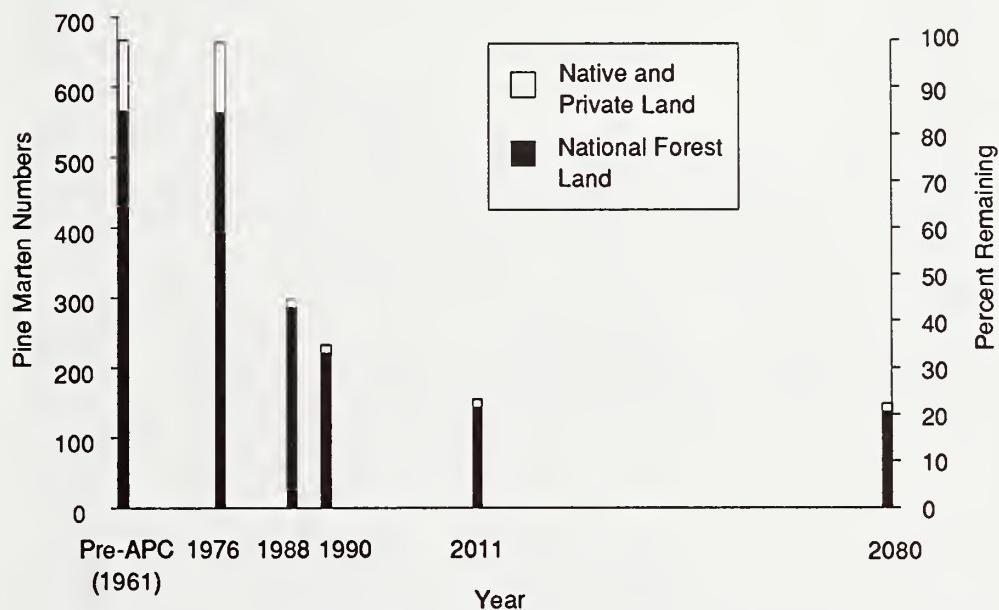
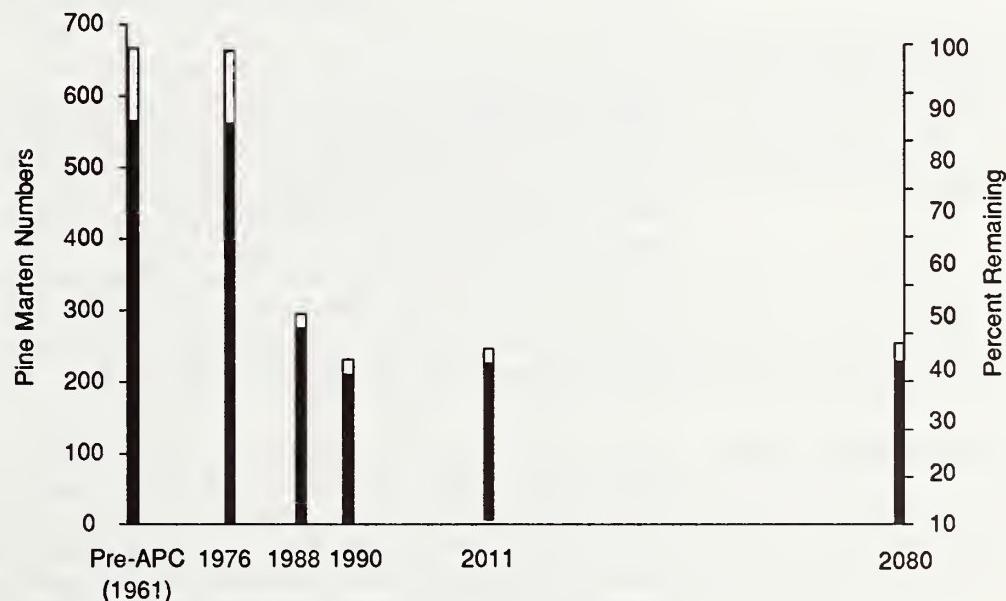


### With Road Management Options



SOURCE: Forest Service in consultation with ADF&G (SEIS Planning Record).

Figure 4-7

**Comparison of Potential Pine Marten Habitat Capability Through One Timber Crop Rotation<sup>1</sup>****Without Road Management Options****With Road Management Options**

SOURCE: Forest Service in consultation with ADF&G (SEIS Planning Record).

<sup>1</sup> Includes effects due to projected harvest under MELP and TLMP.

## 4 Environmental Consequences

ing capacity for martens of the existing stand while managed on a 100-year rotation. Carrying capacity of the post-harvest stand may also be improved through implementation of the second-growth management program. If any road closure management options were implemented as discussed in the Mitigation section of Chapter 4, the habitat capability numbers would show long-term improvement on National Forest land.

If any road closure management options were implemented as discussed in the Mitigation section of Chapter 4, pine marten habitat capability numbers would show long-term improvement on National Forest land. Figures 4-6 and 4-7 illustrate the positive change on pine marten numbers resulting from the proposed road management options. As noted in the earlier impacts discussion, reduction of pine marten trapping would be immediately realized due to closure of newly constructed roads. For those roads already constructed and providing access to back country areas, the positive effect of road closure would take more time. The lower illustration (Figures 4-6 and 4-7) that shows pine marten numbers under the road closure options, indicates this long-term positive effect by 2011 and further on to 2080.

### Land Otter

Land otters generally occur in close proximity to the beach (Larsen 1983, Woolington 1984) within areas identified as beach fringe habitat for the 1986-90 FEIS. It is estimated that 91 percent of the beach fringe habitat would remain unaffected by timber harvest activities through 2011 (Table 4-39). It should be noted that many harvest units within the beach fringe habitat have buffers left between the harvest unit and the beach. These measures should result in only small reductions of land otters by 2011.

### Bald Eagle

It is estimated that the buffer zone of some additional eagle nest trees could be infringed upon by timber harvest activities to 2011. These infringements will be dealt with under a Memorandum of Understanding between the Forest Service and US Fish and Wildlife Service to assure that they would have no effect on carrying capacity for bald eagles (Forest Service 1984a). Normal procedure is not to harvest near known nest trees. Harvest in beach fringe or estuarine fringe will proportionally reduce the capacity of the habitat to produce future nest trees.

### Vancouver Canada Goose

Vancouver Canada geese nest in inland wetland, estuarine fringe, and forested habitats. Within these habitats they often select noncommercial or low-volume forested sites. Harvest of these habitats could affect Vancouver Canada geese. It is estimated that 90 percent of the inland wetland, 98 percent of the estuarine fringe, and 77 percent of the forested habitats (84 percent on National Forest land) would remain unaffected by timber harvest activities through 2011 (Table 4-39). These levels of estimated timber harvest could reduce the carrying capacity for geese in Analysis Area 3. However, it is anticipated that the amount of reduction in carrying capacity would be small, and probably not proportional to the reduction in habitat as Vancouver Canada geese are probably not limited by the abundance of nesting habitats.

## Fisheries/Hydrology

To understand the general changes in watershed and stream conditions, and their affect on fisheries 30 to 50 years following timber harvest, it is useful to address two types of watersheds: upland channels or mountainslope ravines, and lowland channels. Upland channels include mostly Class III AHMUs where the primary management objective is to protect water quality. These streams have little or no resident fish habitat. Lowland channels are primarily low gradient floodplain channels and moderate to low gradient alluvial fan and footslope channels. Lowland channels fall within the Class I and II AHMU categories where the primary management objective is to protect important anadromous and resident fish habitat.

*Sockeye Salmon Spawning  
and Rearing Habitat*

### **Changes to Upland Streams**

Roads corridors frequently cross upland Class III channels. Erosion and sedimentation from channel disturbance associated with construction of stream crossing structures and road use and maintenance could be expected to result in small increases in sediment input and transport. The majority of increased erosion occurs over a period of 2 to 5 years following construction. Short-term (1 to 2 days) water quality degradation near construction activity is likely, however, the likelihood of long-term impacts to downstream water quality (sediment or turbidity) or stream channel stability is generally low.

Large organic debris (LOD) is important in some, but not all, upland Class III streams. Clearcut harvesting along upland Class III channels would reduce large organic debris recruitment, thus reducing instream log step pools over time in some streams. Sediment storage capacity may be reduced, potentially resulting in more rapid routing of bedload sediment to downstream areas. The cumulative effects of changes in coarse sediment routing are unknown.

Upper bank erosion within upland v-notch channels may increase slightly following harvest due to windthrow of ravine timber and ground disturbance from ground-lead yarding within ravines. Increases in sediment delivery from upland channels would occur but should remain within the natural range of sediment discharge based on the results from sediment transport monitoring following timber harvest in a typical Southeast Alaska watershed.

Road construction and timber harvesting activities would increase the risk for mass wasting events such as debris torrents in Class III channels and debris avalanches from unstable mountain sideslopes. Although only a small percentage of natural and management induced

## 4 Environmental Consequences

mass wasting directly impact fish streams, accelerated erosion and sedimentation from management activities would likely result in some localized degradation of spawning gravels and fish rearing habitat.

### Changes to Lowland Streams

The implementation of riparian management prescriptions would substantially limit the amount of streamside harvest activity on Class I anadromous fish streams and Class II resident fish streams. This management approach should result in minimal changes to stream morphology and fish habitat condition. Riparian harvesting prescriptions are designed to minimize impacts related to streambank disturbance, canopy alteration, and large organic debris recruitment.

Proposed harvest by channel type for all alternatives in Analysis Area 3 is displayed in Table 4-26, at the beginning of this chapter

### Large Organic Debris/Channel Stability - Fish Habitat

Large organic debris, which is generally considered to be stable woody material at least 10 centimeters in diameter and 1 meter in length intruding into the stream (AHMU Handbook), is a key component for the maintenance of channel stability and for providing fish habitat in streams of Southeast Alaska. Recent research (i.e., Murphy, et al. 1986, 1987, Heifetz, et al. 1986, Bryant 1980, 1983) has demonstrated the importance of large organic debris for providing a diverse channel morphology, for maintaining channel stability, and for providing cover and refuge habitat for fish. Large organic debris declines over time and must be replaced by new inputs from streamside timber. Impacts of large organic debris should balance the natural depletion rate, otherwise debris dependent habitat will be impacted.

In order to provide a source for future recruitment of large organic debris, the harvest and regeneration of streamside trees needs to be carefully managed. On National Forest lands throughout the SEIS operating period maintenance of instream and future sources of large organic debris, would prevent degradation of channel stability. These measures should maintain fish production, however, the long-term consequences of active streamside management for large organic debris and channel stability have not been measured. Projections made by Sedell and Swanson (1984) based on their model of a managed stream system indicates that fish production from managed streamside zones could potentially be increased, over a 120-year harvest cycle. Active streamside management can increase fish biomass by providing openings in the canopy, which will improve primary and secondary production, and by maintaining input of large organic debris that creates and maintains habitat. (Sedell and Swanson 1984).

The assumptions utilized in the long-term projection of timber harvest for the 1986-90 study area includes not harvesting 80 percent of the trees within 100 feet on either side of Class I and II streams on National Forest lands. (This assumption has been carried through to the end of the contract and harvest rotation periods, 2011 and 2088, respectively). The intent is to ensure that streamside trees of suitable size and length will be available through the rotation to provide sufficient future sources of large organic debris and to maintain channel stability. The proposed 20 percent harvest in conjunction with a second-growth thinning program for past harvest units where second growth or alder is shading the stream will ensure that light penetration will be available to fuel potential increases in fish biomass. The results of this type of program would, at the minimum, maintain the current production and may lead to sustained increased production.

### Stream Temperature

Thermal impacts (from elevated water temperature) are not anticipated during the first harvest rotation (100 years) as a result of timber harvest. Fish Habitat Management Unit streamside timber guidelines anticipate at least 80 percent of the trees within 100 feet of streams will remain standing at the end of the rotation. Application of the standards and guidelines should provide adequate streamside vegetation to eliminate potential stream temperature impacts.

A current aquatic research hypothesis speculates that increased winter temperature caused by timber harvest in Southeast Alaska may cause early emergence of fry from spawning gravels (Elliot 1985, unpublished, Schwan, et al. 1985). Early emergence could cause pink and chum fry to encounter a reduced food supply in estuaries and/or washout of coho fry during the spring runoff. However, elevated winter temperature and sufficient overwinter habitat could lead to a longer growing season for coho fry and juveniles yielding more smolts that may increase adult returns (Schwan, et al. 1985). This is similar to the hypothesis presented by Sedell and Swanson (1984) in their discussion of active streamside management. A long-term watershed evaluation program specifically keyed to winter temperature conditions and the effects of timber harvest would be necessary to sort out the correct conclusion. The current assumption is that with at least 80 percent of the timber volume within 100 feet of streams would remain standing at the end of the rotation, thus minimizing winter temperature effects and potential detrimental impact on fish resources.

### Nutrient Cycling

Available scientific evidence indicates that some soluble nutrients are tightly bound in soil humus layers. Timber harvesting is unlikely to significantly influence nutrient loss from highly organic soils common in Southeast Alaska. Assuming fertilizers or herbicides are not used as silvicultural treatments in the study area, multi-entry harvest over the rotation period should not cause significant long-term cumulative effects on stream nutrient budgets.

### Streamflow

Increased streamflow may provide a deleterious effect to stream habitat, causing a decline in fish population. The best available data on stream runoff responses to timber harvesting suggest that at least 25 percent of a watershed must be harvested in a single entry before measurable increases in stream runoff will occur (Bosch and Hewlett 1982). The harvest percentages for the multi-entry harvest on National Forest lands and estimated harvest of Native Corporation land are listed by VCU in Tables 4-40 and 4-41. All but three of the 13 VCUs have a total harvest level well below 25 percent.

In Southeast Alaska, very little data are available to aid in evaluating the potential long-term effects of second-growth forest on summer low-flows; however, the expected aggregate level of activity in a watershed can be used to make a professional judgment. The cumulative timber harvest over rotation is projected to be generally less than 40 percent for individual watersheds in the 1986-90 study area (Forest Service 1986b, p. 4-259). Multi-entry sustained yield second-growth management will result in a variety of age classes in forest stands spread out over a watershed. These conditions would reduce the risk of significantly affecting summer runoff. Therefore, based on the current state of knowledge, the watersheds in the 1986-90 study area are not judged to be susceptible to long-term cumulative effects of vegetation change on summer low-flow conditions.

### Streamside Disturbance Effects

Long-term inputs of sediment from channel and bank disturbances would be minimal over the harvest rotation. Due to application of Aquatic Habitat Management prescription guidelines on National Forest lands, the total potential miles of streambanks affected is anticipated to be small. Streamside areas with a vegetative buffer strip of undisturbed forest would have negligible stream channel disturbance and sediment inputs from harvest activities. Areas with harvest to the stream bank would employ active streamside management prescriptions, which are designed to minimize disturbances and to maintain habitat. Streamside harvest levels in all VCUs are expected to be less than 20 percent for Class I and II streams over the first harvest rotation. These activities will occur over three harvest entries so the level of disturbance in a given entry will be less than 10 percent of the harvest level monitored in Indian River. Therefore, sedimentation resulting from stream channel disturbance is unlikely.

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Table 4-40

### Acres of National Forest, Native Corporation, Tenakee Springs, and State of Alaska Watersheds Projected to be Harvested Through 2011<sup>1</sup>

VCU	Total Land	Years Since Harvest at Year 2011			Total 2011
		30+ Years <sup>2</sup>	20-30 Years <sup>2</sup>	<20 Years <sup>3</sup>	
<i>National Forest Land</i>					
203	10,945	0	740	445	1,185
204	28,377	0	1,692	1,062	2,754
205	4,237	0	0	0	0
206	0	0	0	0	0
207	10,906	0	0	0	0
208	6,482	0	46	367	413
209	13,198	0	1,937	664	2,601
210	12,611	0	1,490	929	2,419
211	4,687	0	0	517	517
212	13,320	0	1,499	488	1,987
213	3,831	0	181	194	375
214	6,854	0	547	353	900
215	23,253	108	1,639	1,100	2,847
216	10,760	0	487	631	1,118
217	10,232	742	648	396	1,786
218	18,971	655	1,716	725	3,096
219	5,980	212	125	313	650
220	17,617	389	407	987	1,783
221	4,707	245	0	382	627
Subtotal	206,968	2,351	13,154	9,553	25,058
<i>Native Corporation Land<sup>4</sup></i>					
204	6,437	0	300	1,734	2,034
205	7,796	0	1,938	550	2,488
206	4,870	0	1,108	2,593	3,701
207	10,846	0	2,777	5,201	7,978
208	132	0	35	0	35
Subtotal	30,081	0	6,158	10,078	16,236

(Continued)

Table 4-40 (Continued)

**Acres of National Forest, Native Corporation, Tenakee Springs,  
and State of Alaska Watersheds Projected to be Harvested  
Through 2011<sup>1</sup>**

VCU	Total Land	Years Since Harvest at Year 2011			<i>Total 2011</i>
		30+ <i>Years<sup>2</sup></i>	20-30 <i>Years<sup>2</sup></i>	<20 <i>Years<sup>3</sup></i>	
<i>Tenakee Springs and State of Alaska Land<sup>4</sup></i>					
204	383	0	0	0	0
219	733	80	0	0	80
220	2,920	448	0	0	448
221	402	0	0	0	0
<b>Subtotal</b>	<b>4,438</b>	<b>528</b>	<b>0</b>	<b>0</b>	<b>528</b>
<b>Total</b>	<b>241,487</b>	<b>2,879</b>	<b>19,312</b>	<b>19,631</b>	<b>41,822</b>

SOURCE: SEIS Planning Record.

<sup>1</sup> Acreage represents the total acres within a VCU, rather than on the percentage of the VCU which falls outside of a watershed. Total harvest to the year 2011 is based on the Life of Sale Plan prepared in 1982.

<sup>2</sup> Silviculture inventory database for the Chatham Area, Fort Collins, CO.

<sup>3</sup> SEIS Planning Record. Figures shown indicate the Life of Sale Plan volume scheduled has not been harvested as planned, but may be harvested at a higher rate later in the first entry.

<sup>4</sup> SEIS Planning Record; GIS database, Chatham Area Supervisor's Office, Sitka, AK.

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Table 4-41

**Percentage of National Forest, Native Corporation, Tenakee Springs, and State of Alaska Watershed Area to be Harvested Through 2011<sup>1</sup>**

VCU	Years Since Harvest at Year 2011			<i>Total 2011</i>
	<i>30+ Years<sup>2</sup></i>	<i>20-30 Years<sup>2</sup></i>	<i>&lt;20 Years<sup>3</sup></i>	
<i>National Forest Land</i>				
203	0	6.8	4.1	10.8
204	0	6.0	3.7	9.7
205	0	0	0	0
206	0	0	0	0
207	0	0	0	0
208	0	0.7	5.7	6.4
209	0	14.7	5.0	19.7
210	0	11.8	7.4	19.2
211	0	0	11.0	11.0
212	0	11.3	3.7	14.9
213	0	4.7	5.1	9.8
214	0	8.0	5.2	13.1
215	0.5	7.0	4.7	12.2
216	0	4.5	5.9	10.4
217	7.3	6.3	3.9	17.5
218	3.5	9.1	3.8	16.3
219	3.6	2.1	5.2	10.9
220	2.2	2.3	5.6	10.1
221	5.2	0	8.1	13.3
<i>Subtotal<sup>4</sup></i>	<i>1.1</i>	<i>6.4</i>	<i>4.6</i>	<i>12.1</i>
<i>Native Corporation Land</i>				
204	0	4.5	26.9	31.6
205	0	24.9	7.0	31.9
206	0	22.8	53.2	76.0
207	0	25.6	48.0	73.6
208	0	26.5	0	26.5
<i>Subtotal<sup>4</sup></i>	<i>0</i>	<i>20.5</i>	<i>33.5</i>	<i>54.0</i>

(Continued)

Table 4-41 (Continued)

**Percentage of National Forest, Native Corporation, Tenakee Springs, and State of Alaska Watershed Area to be Harvested Through 2011<sup>1</sup>**

VCU	Years Since Harvest at Year 2011			<i>Total 2011</i>
	<i>30+ Years<sup>2</sup></i>	<i>20-30 Years<sup>2</sup></i>	<i>&lt;20 Years<sup>3</sup></i>	
<i>Tenakee Springs and State of Alaska Land</i>				
204	0	0	0	0
219	10.9	0	0	10.9
220	15.3	0	0	15.3
221	0	0	0	0
<b>Subtotal<sup>4</sup></b>	<b>13.0</b>	<b>0</b>	<b>0</b>	<b>13.0</b>
<b>Total<sup>5</sup></b>	<b>1.2</b>	<b>8.0</b>	<b>8.1</b>	<b>17.3</b>

SOURCE: SEIS Planning Record.

<sup>1</sup> Percentages are based on the total acres within a VCU, rather than on the percentage of the VCU which falls outside of a watershed. Total harvest to the year 2011 is based on the Life of Sale Plan prepared in 1982.

<sup>2</sup> Silviculture inventory database for the Chatham Area, Fort Collins, CO.

<sup>3</sup> SEIS Planning Record. Figures shown indicate the life of Sale Plan volume scheduled has not been harvested as planned, but may be harvested at a higher rate later in the first entry.

<sup>4</sup> This value represents the percent of projected harvest for each land owner in the analysis area.

<sup>5</sup> This value represents the percent of projected harvest in the entire analysis area.

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## Mass Wasting Effects

To evaluate the potential cumulative effects of mass wasting on stream channels and water quality, a watershed condition index was determined. This condition index is based on the percentage of extreme hazard soil areas affected by harvest activities within a watershed and indicates the relative risk of management induced sediment inputs from mass wasting.

Long-term development in these watersheds could potentially result in cumulative sediment effects depending on the nature and timing of activities and the location of roads and harvest units with respect to stream channels.

The evaluation of potential cumulative effects of mass wasting should be viewed with caution. The evaluation is based on the potential risk of mass soil movement associated with naturally landslide prone soils. These soils have a high risk of natural mass failures as well as a high risk of management induced failure. The evaluation, however, is not based on-site investigations. Some portions of these hazard soil units have a significantly lower risk of mass failure. Also, this analysis procedure did not consider mass wasting sediment delivery potential into drainage ways and streams and does not evaluate sediment routing through the stream networks. A precise assessment of landslide probability and quantification of cumulative downstream sediment impact potential cannot be developed with current state of knowledge and available data.

## Soils

The stability of soils varies a great deal, depending on such factors as parent material, drainage, drainage dissections (V-notches), slope gradient, and slope form. The events of greatest concern are slope failure and mass wasting, which is defined as the downslope movement of soil and organic material under the force of gravity, and includes debris flows, debris avalanches and debris torrents.

The most important factor in predicting mass wasting potential is slope gradient. Most soils in Southeast Alaska are subject to landslides at a gradient of about 67 percent (Swanson 1969). Once slopes exceed this gradient, their stability decreases significantly.

Soils mapped for Southeast Alaska have been rated as Extreme, High, Moderate or Low for mass wasting hazard (Integrated Resource Inventory Interpretations Handbook, unpublished). Hazard ratings help to predict the probability of slope failure in landscapes of various composition and form. Soils with extreme and high mass wasting hazards are expected to have an increased level of mass wasting above that for the overall average of the Forest. Soils associated with moderate and low mass wasting hazards are expected to have a mass wasting level below that of the overall average for the Forest.

Generally, poorly drained, fine-textured soils on very steep, highly dissected landforms are far more prone to mass wasting events than are well drained, deep, coarsely sorted soils on moderate gradients and smooth landforms.

Recent research on landslides in Southeast Alaska (Swanson 1989) concluded that most landslides occur in unique topographical situations (slopes in excess of 75 percent and hillslope depressions). Although over 90 percent of all landslides in the last 20 years were not related to logging or roads, logging and roads do increase the potential for landslides in a given site. Naturally occurring slides tend to be larger and travel further than logging related slides. Only 3 percent of all slides reach anadromous fish streams.

## High Hazard Soils

Soils rated as High for mass wasting hazard will be found under the following conditions: (1) very steep slopes (greater than 75 percent) with infrequent V-notch dissection, stable parent materials, and well drained soils; (2) steep slopes (55 to 75 percent) with frequent V-notch dissection and well drained soils; (3) steep slopes (55 to 75 percent) with infrequent V-notch

dissection and inadequately drained soils, or (4) moderately steep slopes with frequent dissection, unstable parent materials, and/or poorly drained soils.

Standard management practices may have only limited success, and on-site investigations are necessary to determine the need for mitigating measures. After timber harvest, sites with high mass wasting hazard may experience 5 to 10 times the average mass wasting occurring on the Forest under natural conditions. Slope failures may occur in increasing numbers from 3 to 7 years after timber harvest and then taper off. Mass wasting and slope failures on these soils are usually considered to be “reclaimed from management-induced mass wasting after about 15 years.

### Moderate Hazard Soils

Soils rated as moderate for mass wasting are generally found in the following conditions: steep slopes (55 to 75 percent) with infrequent V-notch dissection, stable parent materials and well drained soils; moderately steep slopes (35 to 55 percent) with frequent V-notch dissection and well drained soils; moderately steep slopes (35 to 55 percent) with infrequent V-notch dissection and inadequately drained soils, or gentle slopes (5 to 35 percent) with frequent dissection, unstable parent materials and/or poorly drained soils. Standard management practices are usually successful. After timber harvest, moderate hazard soils may experience as much as 5 times the mass wasting experienced on the same soil under natural conditions. Slope failures may occur in increasing numbers from 3 to 7 years after timber harvest and taper off rapidly thereafter. The site can be considered “reclaimed” from management-induced mass wasting when slope failures appear to occur in frequency and magnitude equal to that of natural conditions.

### Low Hazard Soils

Soils rated as Low for mass wasting hazard are in generally gently sloping and/or rolling topography. In these cases, steep slope gradients will not be combined with dissection, parent materials, or drainage conditions to pose significant mass wasting hazards. Both natural and management-induced mass wasting events are rare and small in extent. Unlike the other soils, these soils will not experience the average five-fold increase in mass wasting after timber harvest. Mitigation is generally effective in reclaiming these sites.

Soil hazard ratings for specific harvest units may be found in the Unit Cards, Appendix A-1. In Analysis Area 3, the relationship between proposed harvest and soils types for all of the alternatives is displayed in Table 4-1, at the beginning of this chapter.

Blowdown of riparian buffer strips may result in increased bank erosion and possibly increase channel migration in Class I channel segments. Channel shifting associated with debris accumulations or changes in sediment load (bedload aggradation) may reduce the effectiveness of narrow riparian buffer strips in naturally unstable floodplain and alluvial fan streams over time.

The effects of accelerated mass wasting in upland channels and headwater areas on channel stability and habitat capability in downstream Class I stream segments is not well understood. Timber harvesting and road construction activities on high hazard soils will be limited thus minimizing the risk of cumulative sediment impacts on Class I and II streams within a given watershed.

## Marine Environment

Log transfer facilities are currently in operation at Long Island (VCU 204), Kennel Creek (VCU 217), False Bay (VCU 210) and Seal Creek (VCU 213). Although all of these sites would have bark accumulation in the marine environment, management objectives outlined in the Tongass Land Management Program provide for mitigation measures to prevent long-term or irreversible impacts to the marine environment.

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*Sunshine Cove Near Tenakee Springs*



### Recreation

By the end of the APC Contract period, there would be changes in the recreation opportunities in Analysis Area 3, with a shift from the primitive and semi-primitive opportunities that dominate today to predominantly roaded opportunities. An extensive road system of about 350 miles is planned from the existing Hoonah road system. Because Hoonah is accessible by ferry, an abundance of roaded opportunities will be made available to residents of Hoonah and outside communities alike. Although most of the existing recreation activities are still expected to occur in Analysis Area 3, an increase in roaded users may be expected. It is assumed that the Hoonah road system would not connect to the City of Tenakee Springs, which occupies portions of VCUs 219, 220, and 221.

Additional roads constructed to access harvest units would increase roaded acreage while road management practices, including road standards, maintenance, and closures would affect the quality of roaded recreation opportunities. For example, some closed roads may be turned into hiking trails. Opportunities to engage in current recreation activities, including bear, deer, and waterfowl hunting, as well as saltwater and freshwater fishing are expected to continue with modifications to specific areas (see individual VCU narratives below). Also expected to continue are picnicking, camping, beach combing, clamming, boating, and pleasure driving. With more roaded area in the Analysis Area, hunting may increase.

The recreation opportunities that would be available in each VCU of Analysis Area 3 by the year 2011 were evaluated by examining potential ROS changes. The long-term and cumulative effects, discussed by VCU below would occur under any of the action alternatives.

**VCU 204:** VCU 204 would provide primarily roaded opportunities, however, in the southwestern portion, some semi-primitive opportunities would remain. A road along Game Creek

would provide fishing access, as well the potential for development of some recreation facilities, such as a campground. The existing trail on Vortex Mountain would remain.

VCUs 205 through 207: Most of VCUs 205 and 207 are in Native Corporation ownership, as well as all of VCU 206. Timber harvest on private land is expected to be more concentrated than that on Forest Service land and, therefore, the effects of harvest in these VCUs would be more evident. Continued harvest and road construction would result in primarily roaded modified opportunities on Forest Service land. Because these VCUs are close to Hoonah and connected through the Hoonah road system, they will probably provide more rural opportunities to residents of Hoonah, as well as visitors from other areas.

VCUs 208 and 209: Roads would be constructed throughout VCUs 208 and 209, providing primarily roaded opportunities. Sounds of logging would occur throughout the VCUs during much of the planning period. Natural conditions would prevail along most of the shoreline of VCU 208. Even with the shift from more primitive to rural recreation opportunities in these VCUs, the potential for trails from Whitestone Harbor to the outer beach and on Mount Whitestone would remain; as well as the potential for a shelter on Mount Whitestone.

VCU 210 and 211: Extensive roading in these VCUs would provide primarily roaded opportunities. In the northwest portion of VCU 210, the road would pass through an unharvested area, providing roaded recreation opportunities in a more natural setting. Plans for a log transfer facility at False Bay would result in noise from truck and boat traffic in this VCU and False Bay when the LTF is in use. Fishing, clam digging, and beach combing activities may continue there during the APC Contract period, however, in a somewhat modified setting. Sonyakay Ridge would remain a potential location for an alpine trail.

VCU 212: Recreation opportunities would change from largely primitive and semi-primitive to roaded, especially along Gypsum Creek and Wukuklook Creek. Harvest near the mouth of Gypsum Creek would change its appearance to recreational boaters. Other scenic beaches, however, would retain a near natural appearance. Some primitive and semi-primitive opportunities would continue in the higher elevations in the center of these VCUs. In addition to timber harvest and new roads, development of mining claims along Gypsum Creek could have an effect on recreation opportunities in VCU 212.

VCU 213: Little change would occur in VCU 213, with the exception of harvest adjacent to VCU 212, and two small units along Seal Creek. Most of the shoreline areas, including the Iyoukeen Peninsula, would retain a near natural appearance and continue to provide a location for shoreline recreational activities.

VCU 214: Recreation opportunities would shift from predominantly semi-primitive to roaded. Most of the shoreline would retain a near natural appearance.

VCU 215 and 216: Recreation opportunities would become primarily roaded, with road access from Hoonah and Kennel Creek. Active logging would be apparent with sounds of harvest equipment and frequent truck traffic on the roads in these areas. Although most of the southwest shore of Freshwater Bay would remain in a near natural appearance, sounds of periodic logging would be evident there as well. Higher elevation alpine areas would remain unharvested and would provide potential sites for trail development.

VCU 217: This VCU would continue to provide roaded recreation opportunities, including motorcycling and pleasure driving. Kennel Creek logging camp and LTF would remain active through the APC Contract period, and residents of this area would be the primary recreational users. Most of the shoreline areas would remain in a near natural appearance, including the Cedar Cove anchorage area.

VCU 218: Recreation opportunities in VCU 218 would shift from more semi-primitive to more roaded by the end of the APC Contract period. Along Pavlof Harbor, about half of the shoreline would be modified by timber harvest. Much of Washusett Cove would remain in a

## 4 Environmental Consequences

near natural appearance, as well as the Pavlof Lake shoreline. Pavlof Lake would remain a potential site for development of a recreational cabin and trail.

VCU 219: Planned activities would result in little or no change in recreation opportunities and activities in this VCU. Most of the shoreline would retain its near natural appearance and the potential for a trail would remain between Indian River and Cannery Point.

VCU 220: The southern third of VCU 220 is private land owned by Tenakee Springs, therefore the effects of Forest Service planned activities would be primarily limited to its northern and central portions. Recreational opportunities on Forest Service land would shift from semi-primitive to roaded modified. The roads and trails in this VCU would continue to be used by residents of Tenakee Springs for ORV, ATV, motorbike, bicycle, and snowmobile activities.

VCU 221: Recreation opportunities in this VCU would change from semi-primitive, non-motorized to roaded modified on Forest Service lands as road construction and timber harvest take place as projected. Little change is expected on the Tenakee Springs land, which comprises about one sixth of the VCU.

### Visual

The potential for visual impact is greatest right after timber is harvested. In the foreground (up to 1/2 mile), stumps and debris are dominant. Activities associated with road construction, such as cut and fill slopes, rock pits, and turn outs would be readily visible to the observer. As seen in the middleground (1/2 mile to 2 miles), vivid distinction in texture of the mature stand and the harvest unit would be apparent. Exposed boles and limbs of the adjacent stand would dominate the visual setting.

The fifth year of regeneration the young forest would be filling out with low lying vegetation (berry bushes, ferns, etc.). In some cases, young alder would be present where excessive disturbance occurred. In the foreground, the visual effects of the clearcut would still be evident, but the shrubby vegetation and young trees would begin to cover over the stumps and exposed ground. In the middleground, the harvest unit would remain evident, with sharp contrast in color and texture.

From year five to twenty, the young trees would establish themselves, reaching a height of approximately fifteen feet. In the foreground, at the end of twenty years, the forest visitor would see a healthy, thinned stand of spruce and hemlock, with some yellow cedar. If views had been created with the original clear cut, they would become limited. The pre-commercial thinning process would create a well defined stand. In the middleground, the contrast between the harvest unit and the mature forest would be very obvious.

At the end of fifty years, the forest would reach a height of approximately fifty feet. As seen in the middleground, this stand would be approximately half the height of existing mature stands, providing a smooth visual transition at the harvest unit boundary. Should new harvest occur adjacent to the 50-year stand, the effect would be an even less obvious transition. In the foreground, the growth of the stand would limit views beyond the original unit. At the end of fifty years, the canopy would be closing and the forest would appear very dense.

Towards the end of eighty years, the forest would reach 75 percent of its mature height. From the middleground there would be less distinction between this stand and adjacent mature stands. The canopy would appear full with crowns touching, allowing little sunlight to reach the forest floor and little understory vegetation to establish. As seen in the foreground, tree boles of 23-inch diameter would be visibly dominate from the road and the canopy visible at approximately thirty feet from the forest floor. Road side vegetation would include ferns and berries.

At 100 years, little difference would be noticed between the 100-year stand and an adjacent mature stand. Timber would reach approximately 100 feet and appear healthy, lush and with full canopy. In the foreground, the stand would be extremely dense, with little light reaching

*Intermingled National Forest  
and Huna Totem Corporation  
Lands*

the forest floor. Selective harvest or small group selection may be necessary adjacent to recreation roads to allow additional sunlight, for safety purposes, or to increase vista opportunities. In the middleground, the color and texture of the mature stand would allow distinction between it and adjacent mature forests, which display a scattering of dead tops with a generally more irregular tree growth pattern.

Following is a description of the visual condition of each VCU by the year 2011 under the continued implementation of the TLMP and the long term APC contract:

VCU 203: Harvest operations occurring in the upper drainages and side slopes of Seagull Creek would be visible in the middleground from the small boat and plane routes in Port Frederick, assigned Sensitivity Level 2. However, harvest operations would also occur in areas unseen from inventoried travel routes. Harvesting would be consistent with modification and maximum modification VQOs. The lower drainage of Seagull Creek and the shoreline of Port Frederick in this VCU would not be harvested and would remain in a natural-appearing condition.

VCU 204: Changes that would occur in the southern half of this VCU would be visible from the Sensitivity Level 2 road along the Game Creek drainage. Changes in the forest over time, ranging from recent harvest to mature forest stands, would be consistent with modification and maximum modification VQOs.

VCU 205: The majority of the lands within this VCU are in private ownership and there has been intensive timber harvesting in the past. Assuming a continuation of these harvesting activities, viewers could expect to see a landscape dominated by resource development. Many of the remaining parcels, which are in the National Forest System are unseen or seldom seen from travel routes and use areas around Hoonah. There are visually sensitive timber stands on public lands at Elephant Mountain, which would be harvested. To mitigate the visual impact, the harvesting would be done in four entries over a 120-year period. Even with this mitigation, the overall perception of this entire VCU would be one of an intensively managed landscape, consistent with a maximum modification VQO.

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VCU 207: As with VCU 205, the majority of the lands within this VCU are in private ownership. Lands in the Spasski Creek drainage have experienced intensive development-oriented management. The National Forest System lands are visible in the middleground from Icy Strait but are subordinate to the views of private land. Overall, the perception of the entire VCU would be one of an intensively managed landscape.

VCU 208: Overmature timber stands exist along with shoreline of this VCU. Most of this timber is not scheduled to be harvested. Timber harvests are scheduled for the low lying elevations and would be mostly screened by the remaining timber from views from the Alaska Marine Highway and small boat routes in Chatham Strait, although harvest on the side slopes facing the Strait would be visible. There are also views of recently harvested units through existing nontimbered areas along the shoreline. The timber would be harvested in four entries over a 120-year extended rotation to aid in reducing potential visual impacts. In addition, the rolling topography, scattered muskegs, and vegetative patterns would help to absorb changes in the landscape and aid in meeting assigned VQOs. Impacts over the long term would be consistent with a modification VQO.

VCU 209: As in VCU 208, overmature timber stands exist along the shoreline. Most of this timber is not scheduled to be harvested. While changes around Whitestone Harbor would be evident over time, the remaining timber would help to screen the visual impacts. The timber-stands scheduled for harvest would be harvested in four entries over a 120-year extended rotation which would also aid in reducing potential visual impacts. From the saltwater viewing points and the Sensitivity Level 2 road within the VCU, visual changes would range from recent harvest units to young and mature forested stands. Viewers could also expect to see activities associated with the log transfer facility occurring continuously over the entire rotation. Over the long term, visual alterations would be consistent with a modification VQO.

VCU 210: Most of the existing timber stands would be maintained around False Bay and the entrance to Whitestone Harbor and would screen some harvest activities occurring in the lower drainages. Harvest activities on many of the side slopes would be visible in oblique angles from the Alaska Marine Highway and small boat routes in Chatham Strait. The timber stands scheduled for harvest would be harvested in four entries over a 120-year extended rotation that would aid in reducing potential visual impacts. Changes in the landscape throughout this VCU would be consistent with modification and maximum modification VQO.

VCU 211: Timber stands in the majority of this VCU would be harvested in four entries over a 120-year extended rotation that would aid in reducing potential visual impacts. Viewers from the Alaska Marine Highway and small boat routes in Chatham Strait could expect to see changes over time, ranging from recent harvest units to mature forest stands. Most of the existing timber stands along the shoreline are not scheduled for harvest and would screen some of the harvest activities and aid in meeting assigned VQOs. The view of this VCU is middle-ground from marine viewing points and changes in the character of the landscape would be consistent with the assigned modification VQO.

VCU 212: The majority of timber harvest activities would occur in the valley bottoms and side slopes of Gypsum Creek and Wukuklook Creek, and would take place in four entries over a 120-year extended rotation. These activities would be seen at oblique angles in the background from the Alaska Marine Highway and small boat routes in Chatham Strait. Over the entire rotation, viewers could expect to see harvest activities ranging from recent harvest to mature forested stands. Most of the existing timber stands along the shoreline of Iyoukeen Cove are not scheduled for harvest and would aid in screening harvest activities and benefit meeting assigned VQOs. Visible harvest would be consistent with modification and maximum modification VQOs.

VCU 213: The majority of this VCU would remain in a natural-appearing condition over the long term. Some timber harvest would occur north of the Redcliff Islands; however, most of the existing timber stands along the shoreline and is not scheduled for harvest. The timber

scheduled for harvest would be harvested in six entries over 200 years to maintain the visual quality of the area. Viewers from the small boat route in Freshwater Bay could expect to see changes occurring along the upper slopes. Visual alterations in this area would be consistent with the assigned VQOs.

VCU 214: The majority of this VCU is unseen from inventoried small boat routes in Freshwater Bay. Most of the existing timber stands along the shoreline of Freshwater Bay is not scheduled for harvest and would aid in screening views of harvest activities. Impacts from harvest activities would be consistent with the assigned VQOs.

VCU 215: Most of the shoreline areas in this VCU around Freshwater Bay would remain in a predominantly natural-appearing condition. Most of the existing timber stands are not scheduled for harvest. Timber scheduled for harvest would be harvested in a 200-year extended rotation in visually sensitive areas. Both would aid in screening potential visual impacts of the timber harvest. The varied topography in the lower valley regions would also absorb some of the visual changes. Over the entire rotation, viewers would see recent harvest, young timbered stands, and mature forest stands in the upper valley of the north fork of Freshwater Creek. Over the long term these changes would be consistent with the assigned VQOs.

VCU 216: While the majority of this VCU would change in appearance over time, its visibility from popular use areas or travel routes is limited. The changes that would occur would be consistent with the assigned VQOs.

VCU 217: The timber stands in this VCU would be harvested over a 120-year extended rotation. Over time, the most visually apparent changes would be on the slopes along Freshwater Bay across from Redcliff Islands toward Cedar Cove. These would be viewed from the small boat route in Freshwater Bay and the small boat anchorage in Cedar Cove. Viewers could also expect to see activities associated with the log transfer facility and logging camps continuously over the entire rotation. Most of the existing timber stands along the shoreline are not scheduled for harvest. The remaining timber would aid in screening harvest activities, although harvest operations on the upper slopes would still be visible. Over the long term, visual changes would be consistent with a modification VQO.

VCU 218: Recreationists in Pavlof Harbor and Wachusett Cove would see a predominantly natural-appearing landscape in the foreground. Some harvest would occur adjacent to saltwater but the harvesting would be done over a 200-year extended rotation. Timber stands on the exposed upper valley slopes would also be harvested over a 200-year extended rotation and would be visible as middleground and background from Pavlof Harbor, Wachusett Cove, and the small boat routes in Freshwater Bay. The views from the water would be of a changing forest over time ranging from recent harvest to mature forested stands. The 200-year extended rotation period for harvesting would aid in reducing potential visual impacts. Views from the road system within this VCU would reflect visual alterations consistent with modification and maximum modification VQOs.

VCU 219: The timber harvest activities on the upper slopes from East Point to Hill Point would be visible from the Alaska Marine Highway and small boat routes in Tenakee Inlet. The timber would be harvested in a 200-year extended rotation and this, along with the remaining timber along the shoreline, would help to reduce potential visual impacts. Over time, viewers would see some areas of harvest activities ranging from recent harvest to mature forested stands, although a natural appearance would remain dominant in most of the VCU.

VCU 220: The most visually sensitive lands within this VCU fall within the boundaries of the town of Tenakee Springs. These lands are seen in the foreground and middleground from the Sensitivity Level 1 Alaska Marine Highway and small boat routes in Tenakee Inlet. Other than the immediate town site, most of these lands are generally in a natural-appearing condition. Visually sensitive timber stands on National Forest System lands are also seen in the middle ground. These timber stands would be harvested in six entries over a 200-year ex-

# **4 Environmental Consequences**

tended rotation to aid in mitigating the potential visual impacts. The foreground views from the water would be predominantly natural in appearance due to the extended rotation and the maintenance of some existing timber stands adjoining the town boundary. The far middle-ground and background views of this area would be of a continually changing forest environment, reflecting a more intensely managed resource.

VCU 221: Most of the existing timber stands along the shoreline are not scheduled for harvest. Many remaining timber stands would be harvested in four entries over a 120-year extended rotation to aid in mitigating potential visual effects. Over time, viewers from the Sensitivity Level 2 small boat and plane routes in Tenakee Inlet could expect to see a predominantly natural-appearing landscape with both recent harvest areas and maturing stands in previously harvested areas. Expected changes would be consistent with the assigned modification VQO.

## **Cultural Resources**

Impacts from natural decay, landscape changes, private developments, and timber management activities have combined to destroy or disturb a portion of the cultural resources of Southeast Alaska. Development activities of all kinds pose particular threats to cultural resources because they often tend to be located in the same places that cultural resources are sometimes found, such as sheltered coastal settings. In addition, areas where adjacent landowners have clearcut blocks of land or plan an accelerated period of timber harvest are also of concern.

Because little inventory has taken place in the area, it is impossible to determine the exact nature and number of resources that have been lost. Mitigation measures have only been implemented during recent years. Implementing the No Further Harvest Alternative (Alternative 2) would slightly lessen long-term and cumulative effects on cultural resources. The existing cultural resource compliance review process incorporates a consideration of cumulative effects for the proposed action alternatives on National Forest land. Future timber management activities could combine with other ground-disturbance to result in continued loss of cultural resources. The implementation of various mitigation measures would reduce this loss by preserving significant sites and by providing data on those that cannot be preserved, even though the loss of a cultural resource site cannot be completely compensated.

## **Socioeconomic Impacts**

The primary socioeconomic impact of a long-term timber harvest would be a shift in log grades resulting from a transition of mature and overmature stands to second growth, affecting the lumber and wood products industry in Southeast Alaska. This impact would fall most heavily on cant producers in the industry, who require select and No. 1 grade spruce and hemlock logs. Some volume of No. 1 grade logs would exist, however, to support some cant manufacture. Due to the primary processing requirements attached to the purchase of National Forest timber, the wood products industry is expected to continue in Southeast Alaska. As long as logs continue to command higher profits per unit than sawn products in Pacific Rim markets, no incentive would likely exist for native land owners or the State to provide logs to the mills.

The potential of expanding the production of dimension lumber and alternative products could result in a positive impact on the lumber and wood products industry. Recent analyses of alternative product mixes for the Southeast Alaska lumber and wood products industry (ANILCA 706(b) Status Report, Forest Service 1985) indicate that a modest restructuring of the industry could accommodate the harvest of second-growth timber. The product mix associated with this new structure is predicated on current market prices. The restructuring of the industry, although possible with existing prices, would also require investment by the public and/or private sector(s) in new processing facilities.

Pulp production would retain a pivotal relationship in the market for logs and chips in the restructured industry. Cant production, as previously discussed, would be reduced to one-quar-

*Historic Photo of a Child  
Watching Her Mother Weave  
a Basket*



ter of all volume processed, regardless of source. Lumber production would increase to a level equal to the present cant production. Chip production would remain the same, and the remaining volume (about 10 percent) could result in a plywood substitute.

New markets, lower relative production costs compared to other Pacific Rim countries, investment in existing industry to increase productivity, or an increase in prices for Alaska lumber and wood products would aid in the use of second-growth timber. With the stabilizing of these Alaska wood product exports, some of these conditions, as well as a restructuring of the industry, could take place.

#### **Contribution of Timber from State and Private Lands**

Overall demand for Southeast Alaska timber has remained relatively constant over the last 6 years. Demand for National Forest timber, however, has declined since 1980, as timber supplied from private landowners and Native Corporations almost tripled. During the first half of the 1980s, in response to market demand for logs, harvest on private and Native Corporation and other private lands has been directed at the more accessible and better quality timber. Timber from private and Native Corporation and other private lands can be exported as unprocessed logs and are not subject to the "primary manufacture" requirement of National Forest timber. Further, higher quality, unprocessed logs have been in greater demand than the processed wood products from National Forest timber. Timber harvests from private lands throughout Southeast Alaska are expected to range up to 350 million board feet per year until the mid to late 1990s if current market conditions continue. Once these finite high-quality stands of old growth are harvested, the remaining less valuable, low volume stands would be more expensive to harvest and more difficult to market. If demand continues at current levels, the demand for National Forest timber would increase when harvests on other ownerships decline and cost differentials narrow.

The major landholders, other than the Federal Government within or near the APC Contract area, are Native Corporations. They are Sealaska, a Regional Corporation and Huna Totem, a



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Village Corporation. There is also a possibility that Congress will allow Shee Atika Corporation the option of land ownership on Kuiu Island.

To date, approximately, 17,399 acres have been conveyed to the Huna Totem Corporation within Analysis Area 3. The Huna Totem Corporation has harvested 5,858 acres to date, but will probably not harvest additional areas in the next 5 years. Sealaska Corporation owns 12,682 acres of land within Analysis Area 3. At this time, the total Sealaska entitlement in Southeast Alaska has not been established and additional lands within Analysis Area 3 may be conveyed to Sealaska in the future. To date, Sealaska has not harvested timber land in the Hoonah area. Harvest activities are anticipated within the next five years. The amount of harvest that actually takes place on private lands through 2011 will depend on Sealaska's cost share agreements with the Forest Service, the need for the Sealaska Corporation to maintain local employment, the depreciation of existing roads, and the market conditions for pulpwood and sawlogs. Log transfer facilities have been constructed near Humpback Creek (West Port Frederick) and at Long Island for the transfer of both Huna Totem and Sealaska Corporation timber.

## ANILCA Section 810 Subsistence Evaluation

Section 810 of the Alaska National Interest Lands Conservation Act (ANILCA) requires a Federal agency, having jurisdiction over lands in Alaska, to evaluate the potential effects of proposed land-use activities on subsistence uses and needs. Section 810 of ANILCA states:

In determining whether to withdraw, reserve, lease, or otherwise permit the use, occupancy, or disposition of public lands under any provision of law authorizing such actions, the head of the agency having primary disposition over such lands or his designee shall evaluate the effect of such use, occupancy, or disposition on subsistence uses and needs, the availability of other lands for purposes sought to be achieved, and other alternatives which would reduce or eliminate the use, occupancy, or disposition of public lands needed for subsistence purposes. No such withdrawal, reservation, lease, permit, or other use, occupancy or disposition of such lands which would significantly restrict subsistence uses shall be effected until the head of such federal agency:

1. gives notice to the appropriate state agency and appropriate local committees and regional councils established pursuant to ANILCA Section 805;
2. gives notice of, and holds, a hearing in the vicinity of the area involved; and
3. determines that (A) such a significant restriction of subsistence uses is necessary, consistent with sound management principles for the utilization of the public lands; (B) the proposed activity will involve the minimal amount of public lands necessary to accomplish the purposes of such use, occupancy, or other disposition; and (C) reasonable steps will be taken to minimize adverse impacts upon subsistence uses and resources resulting from such action.

As noted in Chapter 3, the 1981-86 Record of Decision (ROD) preceded the passage of ANILCA. The Federal District Court, in *Tenakee Springs v. Courtright*, did not decide if the Forest Service complied with Section 810. To ensure that the 1981-86 and 1986-90 Records of Decision do comply with ANILCA, the Forest Service further evaluated the potential effects to subsistence uses resulting from the proposed actions considered in the Supplemental EIS.

Since ANILCA, one subsistence evaluation has been made for the area included in Analysis Area 3 for the 1986-90 Record of Decision. The evaluation concluded that the proposed actions would have no or only minor potential impact to subsistence users of Analysis Area 3. In *Hanlon v. Barton*, however, the Federal District Court concluded that the Forest Service must consider the cumulative impacts to subsistence resources and subsistence users of past,

proposed, and reasonably foreseeable future activities in conducting an ANILCA Section 810 subsistence evaluation. Further, the Court noted that actions need not be connected to be considered as cumulative effects. Chapter 3 discusses the current and historical subsistence uses on northeastern Chichagof Island (Analysis Area 3), by the rural communities of Angoon, Elfin Cove, Gustavus, Haines, Hoonah, Kake, Klukwan, Pelican, Petersburg, Sitka, Tenakee Springs and Wrangell.

This section evaluates how the proposed action alternatives in Analysis Area 3 could affect subsistence resources used by the above communities. The subsistence resource categories evaluated are fish, timber, wildlife, and other foods such as berries and kelp. Effects of the proposed alternatives are evaluated by: (1) changes in abundance or distribution of subsistence resources, (2) changes in access to subsistence resources, and (3) changes in competition from non-subsistence users for those resources. The evaluation determines whether subsistence uses in Analysis Area 3 or portions of Analysis Area 3 would be significantly restricted by any of the proposed action alternatives. To determine this, the evaluation: (1) considers the availability of subsistence resources in the surrounding areas; (2) considers the cumulative impacts of past and foreseeable future activities on subsistence users and resources; (3) looks at potential cultural and social implications affecting subsistence users; (4) and focuses on the mapped important subsistence-use areas in Analysis Area 3. (Important Subsistence Area Use Map, in Map Packet.)

The evaluation relies heavily upon the use of wildlife habitat capability models as well as upon ADF&G hunter survey data. (See Consolidated Appendix, Volume II, C-3 for discussion of data adequacy and habitat capability models used.)

*The Forest Provides a  
Wealth of Subsistence Foods*



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## DEIS Evaluation

The Draft SEIS subsistence evaluation for Analysis Area 3 focused on the rural communities that intensively use the area for subsistence purposes. The evaluation projected the potential effects to subsistence resources such as fish, wildlife, other subsistence foods, and timber. The intent of the evaluation was to find whether any proposed alternative "may" significantly restrict subsistence use in the Analysis Area. The Findings determined: (1) the proposed action alternatives "may" restrict subsistence use of wildlife; (2) the proposed alternatives would have no or only minor effect on subsistence users for the other categories evaluated; (3) the foreseeable timber harvest schedule prescribed in the Tongass Land Management Plan poses enough potential for affecting subsistence uses to substantiate a finding of "may" restrict subsistence use of wildlife. Based on the Findings and the Federal District Court's Finding in *Hanlon v. Barton*, Subsistence Hearings were scheduled.

Phase I of the Draft SEIS broadly addressed the availability of other lands suitable for the purpose of the Supplemental EIS. (See discussion in Chapter 2, under sections, Areas Eliminated from Detailed Study 1981-86 EIS and Alternatives Eliminated from Detailed Study in 1986-90 EIS.)

The range of alternatives in the Phase II Draft SEIS, for Analysis Area 3, displayed sensitivity for reducing or eliminating proposed actions on subsistence-use lands. This sensitivity has been carried forward into the FEIS for Analysis Area 3.

## Hearings

The hearings and open houses were announced in a letter accompanying the Draft SEIS, mailed June 9, 1989. Letters were sent to the Alaska Department of Fish and Game, Regional Fish and Game Advisory Councils, Local Fish and Game Advisory Committees, and to each Post Office in the eleven communities where hearings were to be held. Announcements were made in newspapers and on radio stations in the northern Chichagof Island vicinity.

An administrative oversight necessitated re-scheduling the hearings from July 10-14 to August 10-12. In late-June, another letter was sent to all people on the EIS mailing list. The letter announcing the hearings also furnished the following information: testimony at the hearing could be either verbal or written; people unable to attend could have another person submit their written testimony at the hearing; people could send written testimony to the SEIS Team if postmarked on or before the date of the hearing in the community the testimony was given.

An open house, beginning at 2:00 pm, preceded each hearing. People were invited to review information presented in the Draft Supplemental EISs and to ask questions of the planning staff who prepared the documents. Information displayed at the Open Houses included maps which displayed harvest units and roads being proposed by each Alternative. Harvest units thought to be of particular concern to the hearing community, were highlighted on the maps displayed. The identification of units of possible concern was based upon TRUCS inventory data. Hearings and open houses scheduled in the vicinity of Analysis Area 3 included:

Hoonah	Aug. 10, 1989	Hoonah City Hall
Point Baker/Port Protection	Aug. 10, 1989	Point Baker Community Hall
Tenakee Springs	Aug. 10, 1989	Community Hall
Wrangell	Aug. 10, 1989	Catholic Parish Hall
Angoon	Aug. 11, 1989	Angoon Town Hall
Pelican	Aug. 11, 1989	Pelican City Hall
Petersburg	Aug. 11, 1989	Forest Service Supervisor's Office
Port Alexander	Aug. 11, 1989	Community Hall
Gustavus	Aug. 12, 1989	Gustavus School
Kake	Aug. 12, 1989	Kake High School
Sitka	Aug. 12, 1989	Verstovia School

On August 10, 1989, hearings were held at Hoonah, Point Baker, Tenakee Springs and Wrangell. At Hoonah, sixty-one people attended the hearing, twenty-nine people gave verbal



*The Tradition of Weaving Spruce Root Baskets is Passed on by Native Community Elders*

testimony, and twenty-seven pieces of written testimony were accepted by the Hearing Officer. At Point Baker, nine people attended the hearing, six people gave verbal testimony, and eleven pieces of written testimony were accepted by the Hearing Officer. At Tenakee Springs, thirteen people attended the hearing, seven people gave verbal testimony and 1 piece of written testimony was submitted prior to the hearing. At Wrangell, eight people attended the hearing, one person gave verbal testimony, and one piece of written testimony was accepted by the Hearing Officer.

On August 11, 1989, hearings were held at Angoon, Pelican, Petersburg and Port Alexander. At Angoon, eight people attended the hearing, seven people gave verbal testimony, and 1 piece of written testimony was accepted by the Hearing Officer. At Pelican, 6 people attended the hearing, two people gave verbal testimony. At Peterburg, eight people attended the hearing and one person gave verbal testimony. At Port Alexander, four people attended the hearing and all gave verbal testimony. No written testimony was received by the Hearing Officers in Pelican, Petersburg and Port Alexander.

On August 12, 1989, hearings were held at Gustavus, Kake and Sitka. At Gustavus, nine people gave verbal testimony at the hearing, and two pieces of written testimony were accepted by the Hearing Officer. At Kake, nine people attended the hearing and all presented verbal testimony. No written testimony was received by the Hearing Officer. At Sitka, seventeen people attended the hearing, five people gave verbal testimony, and forty pieces of written testimony were accepted by the Hearing Officer.

Citizens in Elfin Cove requested a subsistence hearing also be scheduled at Elfin Cove. This request came shortly before the hearings were scheduled to begin. To accommodate their request would have required a new announcement rescheduling all of the hearings. The Forest Service decided to proceed with the hearings as scheduled. In response to Elfin Cove's request, an open house was scheduled in Elfin Cove on August 14, 1989 to provide an opportunity for fishers fishing out of Elfin Cove and citizens residing in the community the chance to comment on the Draft SEIS. Due to inclement weather, the open house had to be cancelled. One written comment was received from the community of Elfin Cove concerning the hearings.

The hearing transcript of the proceedings for each community can be found in Consolidated Appendix, Volume I, B.

The verbal and written testimony received at the hearings provided important additional information pertinent to the subsistence evaluation for the FEIS in Analysis Area 3.

### **Concern About Cultural Change**

The following quotations are taken from several individual testimonies at the Subsistence Hearings in Angoon and Hoonah. The quotations reflect the feelings of some of the Native people who testified at those Hearings concerning cultural change.

"Our Food...This is something we need. It means medicine to our bodies....This is a traditional and cultural way of life and we are responsible to hand it down through generations. ....Indeed, subsistence is our right; it is our birthright."

"Subsistence is the very culture of the Huna Tlingit and is therefore customary and traditional..... Our food source, our bread basket, our big dish, includes Lituya Bay, Glacier Bay, Icy Strait, Black Bay, all through the outside and all through the inside to Freshwater Bay."..." Now our territory (Hoonah Tlingit "core use area") is getting raped....All the way of our life has been destroyed, just about, from what I can see. Inch by inch, you're taking it away.... Now we're having to fight just for our subsistence."

"Until you completely understand the indigenous people of this land, our culture, and what the resources mean to us, I think then maybe you can make a decision on us and our land."

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### Socioeconomic Concerns Expressed at the Hearings

The following quotations are taken from several individual Native and Non-Native testimonies at the Subsistence Hearing in Hoonah. They express the feelings of those participating in the ongoing change on northern Chichagof Island.

"If the logging is shut down, we have to leave. We really love Alaska, but there's just no jobs. My husband a little old to be retrained for something and there's nothing, really, around except logging and fishing..... we really like Alaska and would like to stay here, but you can't support a family unless you have a good job."

"I am a logger and right now I am working at Whitestone. ....They are challenging my subsistence, my livelihood....I've been a logger all my life....I've been up here (Hoonah) for six years...I call this my home...I have four kids here...This is my life and I'm not ashamed of it one bit."

"We started logging here....At the time that we started it, what we were concerned with was the economic stability of our community. At that time fishing was down low.... A lot of them were being stressed by the fact that they couldn't support their families. And our goal was to take a lot of those fishermen and have them taught logging."

"I was born here (Hoonah) and raised here....It's kind of like being between a rock and a hard place for me, because if I say anything good about logging, the elders here won't think very much of me. But it's a living. I'm young, there's lots of advantages, you know....I'm a logger. That's my lifestyle. I fished for eight years, but logging was just something that I liked."

### Final SEIS Findings

Using the information gathered from the hearings and written public comments, the FEIS subsistence evaluation considers, with distinct Findings by alternative and by resource category, whether or not there is a significant possibility of a significant restriction of subsistence use. Again, the resource categories evaluated are fish, wildlife, other foods, and timber. As indicated earlier, the evaluation considers the effects by alternative on (1) access, (2) abundance or distribution, (3) and competition for each resource category.

The Alaska Land Use Council's definition of "significantly restrict subsistence use" is one guideline used in the Findings. By this definition:

A proposed action shall be considered to significantly restrict subsistence uses, if after any modification warranted by consideration of alternatives, conditions, or stipulations, it can be expected to result in a substantial reduction in the opportunity to continue subsistence uses of renewable resources. Reductions in the opportunity to continue subsistence uses generally are caused by: reductions in abundance of, or major redistribution of resources; substantial interference with access; or major increases in the use of those resources by nonrural residents. The responsible line officer must be sensitive to localized, individual restrictions created by any action and make his/her decision after a reasonable analysis of the information available.

The U.S. District Court Decision of Record in *Kunaknana v. Watt* provided additional definitions of "significant restriction of subsistence uses" and are also used as guidelines in the Findings. The definitions from *Kunaknana v. Watt* are:

Significant restrictions are differentiated from insignificant restrictions by a process assessing whether the action undertaken shall have no or slight effect as opposed to large or substantial effects. In further explanation the Director (BLM) states that no significant restriction results when there would be "no or slight" reduction in the abundance of harvestable resources and no occasional redistribution of these resources. There would be no effect (slight inconvenience) on the ability of harvesters to reach and use active subsistence harvesting sites; and there would be no substantial increase in competition for harvestable resources (that is, no substantial increase in hunting by non-rural residents).

Conversely, restrictions for subsistence uses would be significant if there were large reductions in abundance or major redistribution of these resources, substantial interference with harvestable access to active subsistence-use sites or major increases in....non-rural resident hunting.

In light of this definition the determination (finding) of significant restriction must be made on a reasonable bases, since it must be decided in light of the total subsistence lands and resources that are available to individuals in surrounding areas living a subsistence lifestyle.

The Final SEIS evaluates the availability of subsistence resources in surrounding areas that could be accessed without undue risk or economic hardship to subsistence users.

Chapter 3 concludes that all the VCUs in Analysis Area 3 are used for harvest of subsistence resources. However, specific areas within these VCUs are more important for harvesting subsistence resources (Important Subsistence Use Area Map). Some proposed timber harvest units are within mapped important subsistence-use areas. Table 4-42 lists the harvest units by alternative. The locations of the proposed units, found on the alternative maps, are considered in the evaluation and the Findings.

The Final SEIS reevaluated the use of other available lands (1) because of the number of proposed timber harvest units located within mapped important subsistence-use areas within Analysis Area 3 (Important Subsistence Use Area Map) and (2) because of the concern the Hoonah native community has about further impact to their core subsistence use area. Phase I of the Supplemental FEIS addressed the need to harvest timber from Analysis Area 3. Other areas are theoretically available for timber harvest within Analysis Area 3, however, two related factors render it impractical to use them. The first factor involves the logistics of providing timber to Alaska Pulp Corporation to meet the Contract obligations for the remainder of the 1986-90 Operating Period and providing for a smooth transition to the next operating period. These time frames require that the Forest Service avoid alternatives needing extensive road construction or new log transfer facilities involving new or additional permits. The second factor is the limited existing transportation network (road system) within Analysis Area 3. The project time frame constrains where the Forest Service could locate potential timber harvest units and develop additional action alternatives.

## **WILDLIFE FINDINGS**

The rural communities in the vicinity of Analysis Area 3 harvest a variety of wildlife resources. The 1987 Tongass Resource Use Cooperative Study found that wildlife made up 11 to 43 percent of the per-capita harvest of principal subsistence resources used by the rural communities in the vicinity of Analysis Area 3. The pounds per capita ranged from 26 in Klukwan to 156 in Hoonah.

### **Abundance or Redistribution**

#### **Deer**

Deer are an important subsistence resource used by the rural communities in the vicinity of Analysis Area 3. The 1987 Tongass Resource Use Cooperative Study indicated that deer made up just over 5 to 39 percent of the per-capita harvest of principal subsistence resources harvested by subsistence users of Analysis Area 3. The per-capita harvest of deer ranged from 13 pounds by Klukwan residents to 135 pounds by Tenakee Springs residents.

Hearing testimony strongly emphasized the importance of Analysis Area 3 as an area for harvesting subsistence deer. Several people from Hoonah and Tenakee Springs testified at the hearings expressed concern about the potential effects the action alternatives proposed in Analysis Area 3 could have on deer and deer availability for subsistence needs. Others who testified at the Hoonah hearing felt the proposed timber harvest and road construction would be beneficial to the subsistence users.

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Table 4-42  
**Proposed Timber Harvest in Important Subsistence Use Areas (Unit Numbers)**

<b>Alternatives</b>					
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
210-2	210-2	203-126	204-95	204-86	204-95
210-3	210-3	203-127	209-11	204-88	204-121
210-14	210-14	203-128	209-13	204-89	204-122
210-15	210-15	203-129	209-14	204-90	204-137
210-16	212-24	203-130	209-16	204-91	204-138
210-17	212-25	203-131	209-17	204-92	204-139
210-18	212-26	203-132	210-2	204-93	204-140
212-5	212-27	204-86	210-3	204-94	204-141
212-6	212-28	204-88	210-6	204-95	204-142
212-7	214-1	204-90	210-7	204-96	204-143
212-8	214-186	204-91	210-8	204-97	204-157
212-9	214-190	204-92	210-9	204-98	210-2
212-10	215-16	204-93	210-10	204-951	210-3
212-24	215-17	204-95	210-14	209-11	210-6
212-25	215-149	204-99	210-15	209-13	210-8
212-26	218-80	204-12	210-16	209-14	210-14
212-27		204-122	210-17	209-16	210-15
212-28		204-123	210-18	209-17	210-16
212-34		204-124	210-50	210-2	210-17
213-3		204-125	211-1	210-3	210-18
213-4		204-133	211-2	210-6	210-151
213-6		204-134	211-4	210-7	210-156
213-7		204-157	211-5	210-8	211-150
214-1		204-197	212-5	210-14	212-5
214-3		204-198	212-6	210-15	212-6
214-10		208-3 <sup>1</sup>	212-7	210-16	212-7
214-186		208-4 <sup>1</sup>	212-8	210-17	212-8
214-190		208-4 <sup>1</sup>	212-9	210-18	212-9
215-5		209-17 <sup>1</sup>	212-10	210-50	212-10
215-6		209-21 <sup>1</sup>	212-24	212-5	212-24
215-8		209-22 <sup>1</sup>	212-25	212-6	212-25
215-12		210-1 <sup>1</sup>	212-26	212-7	212-26
215-13		210-2	212-27	212-8	212-27
215-16		210-3	212-28	212-9	212-28
215-17		210-12 <sup>1</sup>	212-34	212-10	212-34
215-149		210-13 <sup>1</sup>	212-54	212-24	212-152
217-3		210-14	212-55	212-25	213-3
218-19		210-15	213-3	212-26	213-4
218-80		210-16	213-4	212-27	213-6

Continued

Table 4-42 (Continued)

**Proposed Timber Harvest in Important Subsistence Use Areas  
(Unit Numbers)**

<b>Alternatives</b>					
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
219-2	210-17	213-6	212-28	213-7	
219-3	210-18	213-7	212-34	213-152	
	212-3 <sup>1</sup>	213-44	212-54	213-153	
	212-4 <sup>1</sup>	213-55	212-55	214-1	
	212-5	214-1	213-3	214-3	
	212-6	214-3	213-4	214-10	
	212-7	214-10	213-6	214-186	
	212-8	214-186	213-7	214-190	
	212-9	214-190	213-44	215-5	
	212-10	215-5	213-55	215-6	
	212-12 <sup>1</sup>	215-6	214-1	215-8	
	212-13 <sup>1</sup>	215-8	214-3	215-12	
	212-14 <sup>1</sup>	215-12	214-10	215-13	
	212-23 <sup>1</sup>	215-13	214-186	215-16	
	212-24	215-16	214-190	215-17	
	212-25	215-17	215-5	215-149	
	212-26	215-60	215-6	217-3	
	212-27	215-67	215-8	217-42	
	212-28	215-149	215-12	218-19	
	212-33 <sup>1</sup>	215-180	215-13	218-80	
	212-34	217-3	215-16	219-2	
	213-3	217-42	215-17	219-3	
	213-4	217-56	215-67	219-154	
	213-6	218-19	215-149	219-155	
	213-7	218-21	215-180		
	214-1	218-22	217-3		
	214-3	218-23	217-56		
	214-10	218-25	218-19		
	214-186	218-28	218-23		
	214-190	218-29	218-29		
	215-5	218-31	218-31		
	215-6	218-33	218-35		
	215-8	218-34	218-80		
	215-12	218-35	218-106		
	215-13	218-80	219-2		
	215-16	219-2	219-3		
	215-17	219-3	219-36		

Continued

## 4 Environmental Consequences

Table 4-42 (Continued)

### Proposed Timber Harvest in Important Subsistence Use Areas (Unit Numbers)

Alternatives					
1	2	3	4	5	6
		215-149	219-36	219-39	
		217-3	219-39		
		217-42			
		217-56			
		218-19			
		218-21			
		218-22			
		218-29			
		218-33			
		218-34			
		218-35			
		218-80			
		218-106			
		219-2			
		219-3			

NOTE: Unit numbers are shown by VCU then harvest unit numbers within that VCU. For example, 210-2 is harvest unit 2 in VCU 210.

Refer to alternative maps and the Important Subsistence Use Area map folded at the back of this document.

<sup>1</sup> Timber harvest units deferred per agreement between Hanlon and the Forest Service in the Stipulation for Entry of Injunction filed March 21, 1989.

Examples of testimony from the hearings: "Areas that deer and bear require to survive year around are where best commercial timber are located...I do not think that logging and road building is harming the subsistence resource, especially on North Chichagof Island.....I still see lots of deer every day going to work and coming back....They say all that (logging) is good for them; no way. When it snows, the deer can't get through that snow. They've got no overhead over them. If you take the roof off your head, you're going to get wet....Stumps doesn't provide food for the deer or the wildlife that going to be here. We're going to see it all diminish...The areas towards Whitestone Harbor are where the deer do not have adequate protection for winter...During the wintertime, the deer, most of the deer died off. It wasn't wanton killing by man now, it's wanton logging by man and taking their homes away from, their food, that's killed them off.....The long-term effects forever, and the subsistence will be drastically affected... ..One way to protect it now is not to change the logging or the logging people, but for us to change the Forest Service people and change their regulations to more protect the areas frequented by the deer and so forth....I believe that logging and subsistence can go hand in hand, with the Forest Service help.....Subsistence dependency is predicated upon adequate protection of habitat." (Consolidated Appendix, Volume I)

Chapter 3 Wildlife section projects that deer in the Alaska Department of Fish and Game (ADF&G) 1987 Minor Harvest Areas (MHA) 3523a&b, 3524, 3625, 3626 and 3630 (Figure 3-2) and 1988 MHAs 3523, 3524, 3525, 3531 and 3626 (Figure 3-3) in Analysis Area 3 are currently being harvested at levels greater than the current population can sustain. This was

also pointed out in testimony at the hearing in Hoonah. In fact, the current deer harvest level is greater than what the estimated population could have sustained prior to any timber harvest in Analysis Area 3. This assumes, as was pointed out in Chapter 3, that habitat capability projections from the deer model reflect an approximation of deer population. Further, it is based on the determination by ADF&G that the sustainable harvest is ten percent of the deer population (ADF&G 1989). It is assumed that actual deer harvest for 1987 and 1988 reflects rural and non-rural community demand for deer in 1987 MHA 3523a & b, 3524, 3625, 3626 and 3630 (Consolidated Appendix: Volume I) and 1988 MHAs 3523, 3524, 3525, 3531, and 3626 (Table 3-16). Based on this assumption, the current demand for deer by rural and non-rural communities exceeds the sustainable supply of deer for those Minor Harvest Areas. Additional analysis of the 1987 and 1988 ADF&G hunting data indicates the current demand for deer by the rural communities alone exceeds the present sustainable supply of deer in 1987 MHAs 3523a & b, 3524 and 3625 and 1988 MHAs 3523 and 3524. Thus current deer abundance (abundance defined as ample deer available for harvest) is below the levels needed to sustain current deer harvest by the rural communities harvesting deer in those Minor Harvest Areas.

One hundred thirty-one proposed timber harvest units being considered in the action alternatives are located in the mapped important-deer-subsistence-use areas (Alternative Maps, Important Subsistence Use Area Map and Table 4-42). Forty-six of those proposed harvest units are within the Hoonah "core-use-area" (Figure 3-33). The timber harvest units deferred per agreement between Hanlon and the Forest Service in the Stipulation for Entry of Injunction filed March 21, 1989 are being considered as proposed harvest units in Alternative 3 (Table 4-42). The harvest of the proposed units will effect deer abundance in five of the MHAs in Analysis Area 3. The potential site-specific effects on deer habitat capability are evaluated in the Wildlife section.

The deer habitat capability models used in Chapter 3 Wildlife section project that past timber harvest and road construction activities on national forest and private lands within Analysis Area 3 have reduced potential deer habitat capability from an estimated 5985 deer in 1961 to 5558 today. This represents a 7 percent reduction in potential deer habitat capability. Cumulative effects from past actions indicate potential habitat capability reductions in ADF&G MHAs within Analysis Area 3 range from a 3 to 13 percent reduction (Figure 4-2). Deer habitat capability is assumed to reflect potential deer abundance.

The analysis in Chapter 4 Wildlife section estimates that proposed project action alternative effects could potentially reduce deer habitat capability an additional zero to 3 percent in MHA 3523, zero percent in MHA 3524, 2 to 7 percent in MHA 3525, 8 to 17 percent MHA 3531 and less than 1 percent in MHA 3626 in Analysis Area 3 (Table 4-18).

A further decrease in deer habitat capability is projected in four of the MHAs in the analysis area when the effects from the past activities on all lands are added to the effects from the proposed action alternatives. Cumulative effects from past and proposed actions are projected to range from just over 4 percent reduction in MHA 3523 Alternative 1 to over 19 percent reduction in MHA 3531 in Alternatives Three and Four. The cumulative reduction in deer habitat capability for the total analysis area is projected to range from just over 9 percent in Alternative 1 to approximately 13 percent in Alternative 3. The potential effect on deer abundance approaches substantial in MHA 3531 for Alternatives 3, 4, 5, and 6 with a potential 19 percent reduction in habitat capability. The projected reduction in deer habitat capability in MHA 3531 for Alternatives 3, 4, 5, and 6 would potentially drop the current deer abundance below the level needed to sustain current deer harvest by rural community residents harvesting deer in MHA 3531. As was mentioned earlier, current deer abundance is also below levels needed to sustain current deer harvest by rural communities in MHAs 3523 and 3524.

The foreseeable cumulative effect on deer abundance is projected to become or approach substantial in the foreseeable future when the effects from past timber harvest on all lands are

## 4 Environmental Consequences

combined with the potential project effects and with the foreseeable future effects from the past activities and the proposed project activities for three Minor Harvest Areas in Analysis Area 3. Deer abundance would potentially be substantially reduced in the foreseeable future in MHA 3531 for Alternatives 3, 4, 5, and 6 with 23 to 25 percent reduction in deer habitat capability. It is projected to approach a substantial reduction in the foreseeable future in MHA 3524, MHA 3525 for Alternatives 3, 4, 5, and 6; for Alternative 2 in MHA 3531 it is estimated to be a 16 to 20 percent reduction in habitat capability.

Foreseeable changes in local deer herd distribution are expected in all of the Minor Harvest Areas in Analysis Area 3, when the age of the second growth on the past and proposed timber harvest units reaches twenty-five years of age. This conclusion is based on deer habitat utilization studies in SE Alaska.

### Furbearers

Furbearers are presently being trapped in Analysis Area 3 (Tables 3-19 and 3-21). The Forest Service has no information on the numbers of the trappers harvesting pine marten, land otters, and other furbearers from rural communities within and surrounding Analysis Area 3. In this evaluation, it is assumed that most of the trappers are from those rural communities.

In Chapter 3, Wildlife section, pine marten were selected as an indicator of potential projects effects on furbearers. Past timber harvest and road construction activities on national forest and private lands within Analysis Area 3, have reduced potential pine marten habitat capability from 686 pine marten in 1961 to 303 today. This represents a 56 percent reduction in habitat capability (Table 3-20). Cumulative effects from past actions indicate potential pine marten habitat capability reductions in ADF&G MHAs within Analysis Area 3 range from a 34-65 percent reduction (Figure 4-6). Pine marten habitat capability is assumed to reflect potential pine marten and furbearer abundance. The projected reductions in pine martin habitat capability indicates the potential reduction in pine marten and furbearer abundance from past activities is substantial in Analysis Area 3.

Twenty-three proposed timber harvest units in the action alternatives are located in mapped important-furbearer-subsistence-use areas in Analysis Area 3 (Alternative Maps, Important Subsistence Use Area Map and Table 4-42). The Wildlife section analysis indicates the proposed timber harvest and road construction in the action alternatives would potentially reduce pine habitat capability an additional 11 to 48 percent in MHA 3523, zero percent in MHA 3524, 2 to 6 percent in MHA 3525, 3 to 15 percent in MHA 3531 and zero to 1 percent in MHA 3626 in Analysis Area 3 (Table 4-22).

Cumulative effects from past and proposed actions indicate potential pine marten habitat capability reductions in ADF&G MHAs within Analysis Area 3, range from a 45 to 82 percent reduction (Figure 4-7). The proposed actions add to what is already considered a substantial reduction in potential pine marten and furbearer abundance.

The foreseeable effects on pine marten and furbearer abundance in Analysis Area 3 from past and proposed activities would be offset by administratively and physically closing some roads and by allowing secondary roads to close naturally (Figure 4-6). The resulting benefits of proposed road mitigation would also offset some of the past and proposed project cumulative effects (Figure 4-7). But the benefits probably would not be enough to offset the substantial reduction in potential pine marten abundance in Analysis Area 3 resulting from past and proposed activities on national forest lands and from past activities on private lands.

Other mitigation measures may be necessary to maintain viable pine marten populations in ADF&G MHAs 3523, 3524, 3525, 3531, and 3626. Forest Service and Alaska Department of Fish and Game wildlife biologists estimate a population of fifty pine marten are needed in a Minor Harvest Area to maintain a viable population. Possible measures include closing the trapping season, limiting the number of traps per trapper, and regulating the use of ORVs and other motorized vehicles.

Changes in local furbearer distribution are also expected to be substantial as a result of past and proposed timber harvest. Additional effects on local distribution will occur as the second growth in these timber harvest units and second growth on private lands reaches about 25 years of age. Timber harvest and second growth in these harvest units alter furbearer habitat-use patterns.

### Waterfowl

A variety of waterfowl from Whitestone Harbor, Freshwater Bay, and Tenakee Inlet are harvested by the rural communities using Analysis Area 3. Hearing testimony affirmed the importance of these areas for harvesting waterfowl (Consolidated Appendix, Volume I, B).

The analysis in the Wildlife section indicates the action alternatives do not propose timber harvest in wetland habitat. Because there will be no effect on inland wetland habitat, the waterfowl abundance and distribution is excepted to remain unchanged.

### Brown bear

Residents of rural communities within ADF&G Game Management Unit 4 and the residents from the community of Kake are allowed to harvest Brown bear for subsistence purposes. Analysis Area 3 is within Game Management Area 4. Chapter 3 Table 3-17, displays the brown bear harvest in Analysis Area 3, since 1980. The Forest Service has no data on how many of those bears were harvested by residents of rural communities.

Several people who testified at the Subsistence Hearings in Gustavus and Hoonah expressed concern about the potential project effects on brown bear. "We found a direct correlation between the amount of timber harvested and the number of bears killed for sport and in defense and illegally....Last year we surveyed hunters that had killed brown bear, sport hunters that had killed brown bear in the northeast Chichagof area and we found that over eighty percent of those bears that were taken were taken at the dump or within a quarter mile of the dump....Another indicated that logging and road building on NE Chichagof has resulted in a decreased population of bear... Another note I'll add is the brown bear is one species already threatened by extinction on Chichagof Island, a territorial creature like the Tlingit people." (Consolidated Appendix, Volume I).

Chapter 3, Wildlife section projects nearly a forty-seven percent potential reduction in brown bear habitat capability (Table 3-18) has resulted from past timber harvest and road construction activities on national forest and private lands in Analysis Area 3. The reduction in the ADF&G Minor Harvest Areas within Analysis Area 3 ranges from 35 percent to 58 percent. Brown bear habitat capability is assumed to reflect potential brown bear abundance. The overall reduction in brown bear habitat capability indicates the potential reduction in brown bear abundance from past activities is substantial.

The Wildlife section analysis estimates that the proposed timber harvest and road construction in the action alternatives would potentially reduce brown bear habitat capability an additional 2 to 19 percent in MHA 3523, zero percent in MHA 3524, zero to 6 percent in MHA 3525, 12 to 29 percent in MHA 3531 and 4 to 8 percent in MHA 3626 in Analysis Area 3 (Table 4-20).

Cumulative effects from past and proposed actions project that potential brown bear habitat capability reductions in ADF&G MHAs within Analysis Area 3, range from 42 to 64 percent (Figure 4-5). The proposed actions add to what is already considered a substantial reduction in potential pine marten and furbearer abundance.

The foreseeable effects on brown bear abundance in Analysis Area 3 from past and proposed activities would be offset by administratively and physically closing some roads and by allowing secondary roads to close naturally (Figure 4-4). The resulting benefits of proposed road mitigation would also offset some of the past and proposed project cumulative effects (Figure 4-5). But the benefits probably would not be enough to offset the substantial reduc-

## **4 Environmental Consequences**

tion in potential brown bear abundance in Analysis Area 3 resulting from past and proposed activities on national forest lands and from past activities on private lands.

Changes in local brown bear distribution will occur in the vicinity of ongoing activities during the life of the proposed projects as brown bears tend to avoid contact with people. They do tend to move back into these areas, however, after timber harvest is completed. Foreseeable changes in local brown bear distribution are expected in all of the Minor Harvest Areas in Analysis Area 3, when the age of the second growth on the past and proposed timber harvest units reaches twenty-five years.

### **Marine Mammals**

Federal law prohibits the taking of marine mammals by anyone other than Native hunters. There is no evidence that timber harvest activities have had any effects on marine mammals. Therefore, there would be no possibility of a significant restriction in subsistence use of marine mammals by the rural communities surrounding Analysis Area 3.

### **Access**

Access to historic subsistence-use areas has not been affected by past land-use activities and will not be affected by any of the proposed alternatives. Nor is there a substantial chance it would be affected in the foreseeable future due to activities proposed in this project. This is because traditional access by foot, boat, or float plane would remain the same.

Roads radiating from Hoonah provide access to much of Analysis Area 3 (Analysis Area 3 Map). These roads open up areas that were not previously used for harvesting subsistence wildlife resources. Hoonah residents, logging camp residents at Game Creek and Kennel Creek, and other rural and non-rural community residents who use the Alaska Marine Highway to access Analysis Area 3, currently benefit from the areas made available by the roads. The 1987 TRUCS map data and the Analysis Area 3 Important Subsistence Use Area Map reflect the use of the road corridors. The road construction associated with the proposed timber harvest alternatives would increase access into additional subsistence wildlife harvest areas (Analysis Area 3 Alternative Maps).

A trail connects Tenakee Springs with the existing road in the Indian River valley. This road opens areas not previously used for harvesting subsistence wildlife resources. The 1987 TRUCS map data, ADF&G Subsistence Technical Paper #138 and the Analysis Area 3 Important Subsistence Use Area Map reflect the use of the road corridor. Tenakee Springs residents and other rural and non-rural community residents who use the Alaska Marine Highway system to travel to Tenakee Springs currently benefit from the area made available by the road. Presently, motorized vehicle access is limited to ORVs such as three-wheelers.

Hearing testimony strongly suggests that roads attract residents from surrounding rural and non-rural communities and especially if the roads are connected to a community serviced by the Alaska Marine Highway. The increased use of the road system in Analysis Area 3 to access the wildlife resources by people from communities other than Hoonah and Tenakee Springs is reflected in the concerns expressed in the testimony.

A portion of the hearing testimony in Hoonah and Tenakee Springs centered around the pros and cons of increased road access into wildlife subsistence use areas. "Yes, the roads do open areas previously unavailable for hunting. I remain convinced that the road systems around Hoonah are a means that, properly used, can help subsistence.... Obviously, it's good for hunting.....As far as subsistence goes, I don't feel logging has harmed subsistence hunting at all. It has opened up more road areas, more places to go hunting....I've gone deer hunting quite a bit on this side (West Point). The deer are heavier in West Point... We don't have the road traffic or town traffic or the out-of-town traffic....And any time that a road comes into an area, it does have a negative impact on the hunting, just because of the sheer numbers of people that come into an area. Once the logging is done, where is the roads going to take us

to, stumps.....I believe that the Forest Service should close off many of the non-mainline roads to any kind of wheeled vehicles." (Consolidated Appendix Volume I).

In Analysis Area 3, the Final SEIS proposes to physically close off access on some roads and to allow the natural process of vegetative growth to close off secondary roads. This would occur after the proposed project is completed. The purpose is to mitigate the cumulative past, proposed, and foreseeable future effects on brown bear and pine marten. This will assist maintenance of viable populations of both species in portions of Analysis Area 3. In the short term, this will have no effect on access to subsistence-use areas now available from existing roads. Also, it will have no effect on new potential use areas that will be made available from roads proposed for construction in this project. In the foreseeable future, however, access to these wildlife subsistence-use areas will be reduced as the roads naturally fill in with alder and other vegetative growth. To the subsistence users who learn to depend on these roads, the change could be perceived as substantial. They would have to find another way to reach the areas or use traditional means to access other surrounding subsistence use areas.

### Competition

Competition for wildlife resources on northern Chichagof Island is an issue to residents of Hoonah and Tenakee Springs. The intensity of the issue was reflected in the hearing testimony from both communities. It focused on deer harvest.

Examples of the hearing testimony concerning competition: "I've seen license plates from Haines, from Juneau, coming from all over the place, hunting deer. I've seen truck loads of deer go out.... That's not caused by logging....They should put a limit, a bag limit on the number of deer you can take out. They could lower that for out-of-towners.....The hunters from Juneau they...come over here. They hunt us out....My husband's hunting habitats have changed since we moved to Tenakee. He now avoids the Indian River area that he used to hunt regularly but is now heavily hunted by three-wheeler hunters.....I have for several years thought the bag limit for deer is far too high.....What I've heard tonight sounds as though we're having a lot of problems with weekend warriors....And I thought to myself, this is not a logging problem..I mean, this isn't a Forest Service problem it's a Fish and Game problem....We need to put some kind of limit on the weekend warriors, their bag limit. We need to address that through the Fish and Game....Deer season is to long and the bag limit is too many.....But, like a lot of other people have said, I think that the fishing and hunting (especially hunting) should be regulated more by the state agencies that regulate it so that we don't get those big truckloads of deer coming out of Hoonah by people that don't even live here." (Consolidated Appendix, Volume I).

One person at the hearing in Hoonah stated the 1987 deer harvest in Analysis Area 3 was greater than the area could sustain and that Juneau hunters were out-hunting them. Additionally, data was provided that displayed 1987 deer harvest by community. This data presented in Table 4-43 and the recently available 1988 deer harvest data presented in Table 4-44 supports those who testified that non-rural hunters are harvesting a substantial number of deer on northern Chichagof Island. The testimony also shows there is concern that other rural community residents are harvesting too many deer in this area.

The residents of the logging camps at Game Creek and Kennel Creek are competing with other rural community residents for wildlife resources in Analysis Area 3. The 1987 and 1988 deer harvest data verify that residents from both camps are harvesting deer in the analysis area. If the logging camp residents meet residency requirements, they would qualify as subsistence users. It is possible, though, that some residents employed by the two logging companies are Alaska nonresidents and non-rural residents. Most non-rural and Alaska nonresidents are employed seasonally by the logging companies and leave prior to peak hunting times.

At some point, the Alaska Board of Game may have to use its authority to further regulate non-subsistence harvest of deer due to the competition for deer in east Port Frederick and up-

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**Table 4-43  
1987 Deer Harvest for ADF&G Minor Harvest Areas 3523, 3524, 3625 and 3626<sup>1</sup>**

MHA	Deer Harvested			Percent Harvested	
	Rural	Non-rural	Total	Rural	Non-rural
3523	627	439	1,066	58.8	41.2
3524	159	102	261	60.9	39.1
3625	254	281	535	47.5	52.5
3626	86	166	252	34.1	65.9
Total	1,126	988	2,114	53.3	46.7

<sup>1</sup> MHA 3523 includes both sides of Port Frederick in which some of the MHA is outside Analysis Area 3.

**Table 4-44  
1988 Deer Harvest for ADF&G Minor Harvest Areas 3523, 3524, 3525, 3531 and 3626<sup>1</sup>**

MHA	Deer Harvested			Percent Harvested	
	Rural	Non-rural	Total	Rural	Non-rural
3523	140	44	184	76.1	23.1
3524	307	137	444	69.1	39.1
3525	119	245	364	32.7	67.3
3531	89	56	145	61.4	38.6
3626	50	126	176	28.4	71.6
Total	705	608	1,313	53.7	46.3

<sup>1</sup> Deer harvest in MHA 3626 was prorated to reflect the deer harvest in the portion of the MHA that is in Analysis Area 3.

per Tenakee Inlet in ADF&G 1988, MHAs 3523, 3524, 3525, 3531, and 3626. They may also have to prioritize the harvest of deer among the rural communities whose residents are harvesting deer in these four minor harvest areas. This type of action, as prescribed by ANILCA Section 804, may be necessary to ensure the availability of adequate abundance of deer needed by the rural communities using northern Chichagof Island.

In Gustavus, concern was expressed about increased competition for deer. Also, the reduced deer abundance on northern Chichagof Island could increase competition for deer and other subsistence resources on Pleasant Island. People who testified at the Angoon hearing said, "You ignore the regional aspect of subsistence....You ignore the growing competition for those areas not logged, such as Admiralty.. A lot of times we were accused of being stingy with our island. But everybody is coming now, everybody who's area is over-logged is coming to our area to hunt." Sustainable deer abundance in two MHAs in Analysis Area 3 is presently is below the level needed to meet deer demand. Reduction in deer abundance from past and proposed land-use activities and the foreseeable cumulative effects from those activities is projected to be substantial in three MHAs. The cumulative effects on brown bear and pine marten habitat capability from past and proposed activities will substantially reduce abundance of brown bear and furbearers in Analysis Area 3.

**Finding**

Based on the above analysis, the Final SEIS concludes the actions proposed in Alternative 1, 2, 3, 4, 5, and 6 do present a significant possibility of a significant restriction of subsistence use of wildlife in Analysis Area 3. The Finding is based on the potential resource effects by the three evaluation categories shown in Table 4-45. "Yes" indicates a significant possibility of a substantial effect and "no" indicates an insignificant possibility of a substantial effect.

**FISH AND SHELLFISH FINDINGS**

Fish and shellfish are an important subsistence resource used by the rural communities in the vicinity of Analysis Area 3. The 1987 Tongass Resource Use Cooperative Study indicated fish and shellfish made up 55 to 86 percent of the per-capita harvest of principal subsistence resources harvested by subsistence users of Analysis Area 3. The pounds per capita ranged from 95 in Sitka to 238 in Hoonah.

One proposed harvest unit in VCU 203 is in the mapped important-salmon-subsistence-use areas (Alternative Maps, Important Subsistence Use Area Map and Table 4-42).

**Abundance and Distribution****Salmon**

Salmon are a major subsistence food harvested by residents of the rural communities surrounding Analysis Area 3. The per-capita harvest of salmon ranged from 30 pounds by Wrangell residents to 124 pounds by Klukwan.

A common theme expressed at the hearings was a concern for salmon spawning and rearing habitat. A fisherman at Hoonah stated: "I'm here to testify about subsistence, and for creeks that I don't want ruined. The Forest Service is supposed to make buffer zones and stuff, but what about the little tributaries, because cohoes spawn in them." A logger at Hoonah: "Think that maybe they're right about some things about maybe having a little bigger buffer zone between logging and the creek, between the logging and the beach." (Consolidated Appendix, Volume I).

The Fisheries section concludes that potential effects of the proposed timber harvest and road construction alternatives on salmon spawning and rearing habitat would be minimal or eliminated by applying the Forest Service standards, guidelines, and prescriptions, described in detail in the Aquatic Habitat Management Handbook (AHMU). All proposed timber harvest units near salmon spawning and rearing streams are protected by buffers of at least 50 feet. (Alternative Maps). Specific AHMU prescriptions are in Appendix A-1 for all the proposed cutting units near or within the AHMU boundaries.

Table 4-45

**Significant Possibility of a Significant Restriction of Subsistence Use of Wildlife Resources<sup>1</sup>**

	Alternatives					
	1	2	3	4	5	6
Abundance or Distribution	yes	yes	yes	yes	yes	yes
Access	no	no	no	no	no	no
Competition	yes	yes	yes	yes	yes	yes

<sup>1</sup> "No" indicates an insignificant possibility of a substantial effect. "Yes" indicates a significant possibility of a substantial effect.

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*Natives Made Salmon Harvest Easier by Building Rock Wiers to Confine Returning Salmon to Narrow Passages*



The Forest Service projects the foreseeable effects on the abundance and distribution of salmon for subsistence uses in Analysis Area 3 would not be measurable based on the implementation of these site-specific prescriptions for protecting salmon spawning and rearing habitat.

### Other Finfish

In a paper presented at the Development Impacts on Subsistence Fisheries Symposium at the 1989 National American Fisheries Society Meeting, Schroeder indicated that Hoonah residents have noted a decline in herring spawning at a site near the Long Island LTF and that this site was a spot where herring eggs were traditionally gathered (Schroeder 1989). The paper pointed out that log debris in the water from the nearby Long Island LTF and change in water flow patterns created by the causeway linking Long Island with Chichagof Island have been advanced as reasons for the decline in herring spawning at the site.

The Long Island LTF is operated jointly by the Huna Totem and Sealaska Corporation and the Forest Service under a cost-share agreement. A portion of the timber proposed for harvest in the action alternatives will be transported to this LTF. The Marine Environment section points out that the effects of the alternatives will be small incremental additions to existing bark deposits and would result in minor effects to benthic organisms. The section further points out the effects of a log transfer facility on herring is difficult to address as no known data are available on the relationship between a log transfer facility and herring.

Based on the conclusions in the Marine Environment section in Chapter 4, the action alternatives for the proposed project would have minor potential further impact on herring spawning near Long Island and no foreseeable impact on other finfish habitat adjacent to Analysis Area 3. The abundance and distribution of those other finfish would not be affected since there would be no foreseeable impact on other finfish habitat and the potential effects associated with the operation of the Long Island Log Transfer Facility are limited to a very small area.

### Shellfish

At the Hoonah Subsistence Hearing some people testified that in the Port Frederick area near the Long Island LTF, crabs and other shellfish are not as plentiful as in the past. They attributed the decline on the effects of logging and over-harvesting.

In evaluating the potential effects of proposed timber harvest and road construction on habitat for crabs, clams, and other shellfish, it is determined that Alternative 1 would have no measurable effect. The Marine Environment section indicates that since no new LTFs are being proposed in the action Alternatives 2, 3, 4, 5, and 6, the effects will be small incremental additions to existing bark deposits resulting in minor effects to benthic organisms. Based on this, the effect on the abundance and distribution of local crabs, clams, and other shellfish would not be measurable. The project effects for the foreseeable future would also not be measurable.

### Access

Access to historic subsistence-use fishing areas has not been affected by past land-use activities and would not be affected by any of the proposed alternatives. Nor is there significant possibility it would be affected in the foreseeable future due to activities proposed in this project. This is because traditional access by foot, boat and float plane would remain the same.

Roads radiating from Hoonah provide access to much of Analysis Area 3. These roads open up areas that were not previously used for harvesting subsistence fish and shellfish resources. Hoonah residents, logging camp residents at Game Creek and Kennel Creek, and other rural and non-rural community residents who use the Alaska Marine Highway to access Analysis Area 3, currently benefit from the areas made available by the roads. The road construction associated with the proposed timber harvest alternatives would increase access into additional subsistence fish and shellfish harvest areas (Analysis Area 3 Alternative Maps).

A trail connects Tenakee Springs with the existing road up the Indian River valley. This road accesses stream reaches which were not previously used for harvesting subsistence salmon resources. Tenakee Springs residents and other rural and non-rural community residents who use the Alaska Marine Highway system to travel to Tenakee Springs currently benefit from the area made available by the road. The Forest Service has no data concerning the use of roads in Analysis Area 3 to travel to fish and shellfish harvest areas by the people from communities other than Hoonah, Tenakee Springs and the logging camps at Game Creek and Kennel Creek.

In Analysis Area 3, the Final SEIS proposes to physically close off access on some roads and to allow the natural process of vegetative growth to close off secondary roads. This would occur after the proposed project is completed. The purpose of this is to mitigate the cumulative past, proposed, and foreseeable future effects on brown bear and pine marten. This will assist maintenance of viable populations of both species in portions of Analysis Area 3. Allowing the secondary roads to close will have no foreseeable effect on subsistence use of fish and shellfish harvest areas made available by the roads. The mainline roads will remain open and most of these areas are accessed by the mainline roads (primary roads). Also, there are ample opportunities to harvest salmon, shellfish and other finfish in surrounding areas.

### Competition

In the DEIS, the Forest Service concluded that although there was potential for competition for fish and shellfish from residents of the Whitestone and Kennel Creek logging camps, there was no evidence of conflicting use for those fish. None of the written comments on the DEIS or the testimony given at the hearings indicate salmon availability to subsistence users is being affected by sport harvest and non-rural harvest. At the Hoonah Subsistence Hearing,

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some people testified crabs and other shellfish are not as plentiful as in past years in the Port Frederick area. They believe part of the reason is over-harvesting.

The hearing testimony suggests the residents of the logging camp at Game Creek are competing with Hoonah residents using Analysis Area 3 to harvest shellfish. As indicated in the discussion concerning competition for wildlife, there may be some increased competition for subsistence resources from rural residents, Alaska nonresidents and non-rural residents employed at Game Creek and Kennel Creek logging camps. The increase in competition from non-rural residents and Alaska nonresidents would not be substantial due to the availability of fish resources in the immediate vicinity and in the surrounding areas.

### Finding

Based on the above analysis, the Forest Service concludes the actions proposed in Alternatives 1, 2, 3, 4, 5, and 6 do not present a significant possibility of a significant restriction of subsistence use of fish and shellfish in Analysis Area 3. The Finding is based on the potential resource effects by the three evaluation categories shown in Table 4-46. "Yes" indicates a significant possibility of a substantial effect and "no" indicates an insignificant possibility of a substantial effect.

### OTHER FOODS FINDING

Information and data from the Tongass Resource Use Cooperative Study (TRUCS) and the Subsistence Hearings have provided the Forest Service with additional information concerning the gathering of other foods by rural communities using Analysis Area 3. Other foods include plants such as kelp, goose tongue, a variety of berries, etc. Though other foods did not constitute a major portion of the 1987 subsistence harvest by the rural communities documented in TRUCS, they are considered subsistence resources. The TRUCS indicated plants made up 2.0 to 7.5 percent of the per-capita harvest of principal subsistence resources harvested by subsistenceusers of Analysis Area 3. The pounds per capita ranged from 3.3 in Wrangell to 23 in Port Alexander.

### Abundance and Distribution

Most traditional other food gathering occurs near beach and estuarine areas. Timber harvest units and road construction proposed in action Alternatives 1, 2, 3, and 6 in Analysis Area 3, could infringe upon beach areas that are potentially used for other food gathering (Analysis Area 3 Alternative Maps). The availability of numerous other food gathering areas in the immediate vicinity would negate the potential impact to rural community residents using the area.

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Table 4-46  
**Significant Possibility of a Significant Restriction of Subsistence Use of Fish Resources<sup>1</sup>**

	Alternatives					
	1	2	3	4	5	6
Abundance or Distribution	no	no	no	no	no	no
Access	no	no	no	no	no	no
Competition	no	no	no	no	no	no

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<sup>1</sup> "No" indicates an insignificant possibility of a substantial effect. "Yes" indicates a significant possibility of a substantial effect.

The proposed timber harvest activity would improve the availability of berries in the short-term. Based on this increase of berries and the availability of surrounding areas for other food gathering, the project effects and the project foreseeable effects from the proposed action alternatives are not expected to substantially affect the abundance and distribution of other foods in Analysis Area 3.

### Access

Access to traditional other food gathering areas has not been affected by past land-use activities and will not be affected by any of the proposed alternatives in Analysis Area 3. Also, there is not a significant possibility it would be affected in the foreseeable future due to activities proposed in this project. This is because traditional access by boat or foot would remain the same.

Roads radiating from Hoonah have provided another means of access to much of Analysis Area 3. These roads open up areas that were not previously used for harvesting subsistence other food resources. Hoonah residents, logging camp residents at Game Creek and Kennel Creek, and other rural and non-rural community residents who use the Alaska Marine Highway to access Analysis Area 3, currently benefit from the areas made available by the roads. The road construction associated with the proposed timber harvest alternatives could access additional other food gathering areas not presently used for harvesting other foods (Analysis Area 3 Alternative Maps).

A trail connects Tenakee Springs with the existing road in the Indian River valley. This road opens areas that were not previously used for harvesting subsistence other food resources. Tenakee Springs residents and other rural and non-rural community residents who use the Alaska Marine Highway system to travel to Tenakee Springs currently benefit from the area made available by the road. In Analysis Area 3, the Final SEIS proposes to physically close off access on some roads and to allow the natural process of vegetative growth to close off secondary roads. This would occur after the proposed project is completed. The purpose was discussed earlier in the discussion concerning access to wildlife subsistence-use areas. In the short-term, this will have no effect on access to other food gathering areas made available by existing roads. It also will not effect short-term use of areas that will be accessed by roads proposed for construction in this project. In the foreseeable future, access to these food gathering areas would be reduced as the roads on national forest lands fill in with alder and other vegetation.

To the subsistence user who learns to depend on these roads in Analysis Area 3, the change could be perceived as a substantial loss. The most likely affected would be residents of Hoonah, Tenakee Springs and the Game and Kennel Creek logging camps. The effect of the loss of access to the other food gathering areas due to the natural road closures, however, is not expected to be substantial. There are ample opportunities for food gathering in surrounding areas.

### Competition

No concern about competition for other foods was expressed at the Subsistence Hearings or in the written comments received on the DEIS for Analysis Area 3.

As indicated in the discussion concerning competition for wildlife, there may be some increased competition for subsistence other food resources from rural residents, Alaska nonresidents and non-rural residents employed at the logging camps at Game Creek and Kennel Creek. The increase in competition from non-rural residents and Alaska nonresidents, however, would not be substantial due to the availability other food gathering sites in Analysis Area 3 and the surrounding areas.

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### Finding

Based on the above analysis, the Forest Service concludes that the actions proposed in Alternatives 1, 2, 3, 4, 5, and 6 do not present a significant possibility of a significant restriction of subsistence use of other food resources in Analysis Area 3. The Finding is based on the potential resource effects by the three evaluation categories shown in Table 4-47. "Yes" indicates a significant possibility of a substantial effect and "no" indicates an insignificant possibility of a substantial effect.

### TIMBER FINDING

The Forest Service personal free use policies in Alaska for firewood and timber remain unchanged from the 1986-90 Operating Period EIS for the APC Long-Term Sale. Since the Forest Service policy is still in effect, the proposed alternatives for Analysis Area 3 will have no effect on the availability of firewood and personal use timber.

### Mitigation

Because most subsistence use involves the harvesting of fish and game, mitigation measures that protect or enhance fish and game resources will also protect and enhance subsistence activities. Mitigation measures are built into each of the action alternatives considered in this SEIS. These specific measures are detailed on the unit cards in Appendix A-1 and also at the end of this chapter in the mitigation section, and are briefly summarized here.

Fish habitat is protected in each alternative through the application of AHMU prescriptions along every Class I and II stream as well as along some Class III streams. AHMU prescriptions, in addition to protecting fish habitat, also protect riparian habitat important to other species such as deer, bears, and furbearers.

Mitigation to enhance deer habitat in second growth stands following timber harvest includes thinning to a wider than normal spacing which is designed to improve forage. Thinning to a wider standard has been successfully employed in Southeast Alaska.

Another form of mitigation that is built into the design of the alternatives is the location of the harvest units. Harvest units are intentionally located away from important fish and old growth habitat, to the extent practicable, to reduce effects on these habitats. The proximity to prior harvest units is also considered so as to reduce cumulative effects, particularly as they relate to successive harvests within a single watershed. Beach fringes and estuarine habitats are also avoided as much as possible.

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Table 4-47  
**Significant Possibility of a Significant Restriction of Subsistence Use of Other Food Resources<sup>1</sup>**

	Alternatives					
	1	2	3	4	5	6
Abundance or Distribution	no	no	no	no	no	no
Access	no	no	no	no	no	no
Competition	no	no	no	no	no	no

<sup>1</sup> "No" indicates an insignificant possibility of a substantial effect. "Yes" indicates a significant possibility of a substantial effect.

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An APC Worker Checks for Uniformity in Processed Pulp Bales



Although not directly related to subsistence, there was concern expressed at the subsistence hearings by Alaska Natives about the protection of cultural resources. Mitigation designed to protect cultural resources includes additional field reconnaissance of any areas with a moderate, or higher, probability of cultural resource presence. In addition, the Timber Sale Contract provides authority to suspend timber harvest or road construction activities on sites where cultural resources are discovered.

## Reasonably Foreseeable, Long-Term, and Cumulative Programmatic Effects

The Final SEIS evaluates the reasonably foreseeable future effects of each alternative. It also evaluates projected programmatic and cumulative long-term effects associated with continued implementation of the Forest Plan. The Subsistence evaluation considers both types of long-term effects. The Forest Service is uncertain about the site specific location of future activities associated with long-term programmatic projections. The precise location of future projects is not clearly known until when a project is proposed. The Subsistence evaluation for long-term programmatic effects concludes whether or not future activities may restrict subsistence uses.

The 1986-90 Operating Period Life of Sale Plan (Analysis) projects that an additional 10,500 acres of timber will be harvested from the VCUs in Analysis Area 3 by 2011. During this period, Huna Totem and Sealaska Corporations are projected by Forest Service staff to have harvested an estimated 9,850 acres of timber on their lands in Analysis Area 3. Under TLMP prescriptions for this same area, 53,000 acres are scheduled for timber harvest by 2080.

The Wildlife and Fisheries sections project this level of harvest would affect the habitat capability of several wildlife species and may also affect the habitat capability of some salmon species. The changes in habitat capability could affect their abundance and distribution. The

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potential decrease in abundance could increase competition for those species. Most of these species are important subsistence resources used by the rural communities surrounding the Analysis Area. Actions on other lands surrounding the analysis area could also affect the abundance or distribution, access to, and competition for the subsistence resources harvested by the rural communities using Analysis Area 3.

Enough is known about Forest Service programmatic activities and potentially foreseeable activities on other lands surrounding Analysis Area 3 to project that subsistence-uses may be significantly restricted in the future.

The Forest Service is revising TLMP through the NEPA process. Potential effects to subsistence users will be addressed during the revision. Future project environmental analyses will be required prior to harvest any additional timber beyond the amount proposed in this project. Subsistence use effects will be evaluated in those analyses.

Should subsistence resources become limiting at some point, the Alaska Board of Game has the authority to regulate non-subsistence uses of these resources. This type of action, as prescribed by ANILCA Section 804, may be necessary to ensure the availability of adequate subsistence resources needed by the rural communities using southeast Chichagof Island.

### Final Conclusions

Section 810 (a) (3) of ANILCA states that when a use, occupancy, or disposition of federal lands significantly restrict subsistence uses, determinations also must be made that the proposed action (1) is necessary, consistent with sound management of public lands, (2) involves the minimum amount of public lands necessary to accomplish its purpose and (3) reasonable steps will be taken to minimize adverse impacts on subsistence uses and subsistence resources resulting from the action. As stated in the Final SEIS Findings above:

- (a) The potential foreseeable effects from the action alternatives of the proposed project in Analysis Area 3 present a no, or only slight significant possibility of a significant restriction of subsistence uses of fish, shellfish, timber and other foods.
- (b) The potential effects from the action alternatives of the proposed project in Analysis Area 3 present a significant possibility of a significant restriction of subsistence uses of wildlife.

The Final SEIS Findings further project subsistence use may be significantly restricted in Analysis Area 3 from the results of implementing long-term management direction in the Tongass Land Management Plan , from future actions on other surrounding lands, and from adding those potential effects to the foreseeable effects of the proposed action.

#### Necessity (Consistent With Sound Management of Public Lands)

The actions proposed in this document have been examined to determine whether they are necessary, consistent with the sound management of public lands, to meet APC Contract obligations and achieve multiple use management objectives in the Tongass Land Management Plan. Standards used for the review include (1) the National Forest Management Act of 1976 and its implementing regulations; (2) the Alaska National Interest Land Conservation Act; (3) the Alaska Regional Guide; (4) the Tongass Land Management Plan; (5) the Alaska State Forest Practice Act; and (6) the Alaska Coastal Management Program.

Based on the analyses presented in Chapters 1, 2, and 4, the selected alternative (Proposed Action) is necessary and consistent with the sound management of public lands.

#### Amount of Land

The amount of land necessary to undertake the proposed action could be lessened somewhat by concentrating harvest in higher volume stands. The higher volume stands, however, are those most valuable as fish and wildlife habitat. The alternatives represent a balance between impacting the fewest acres, meeting existing contract commitments, and minimizing impacts

on other resources. Thus the minimum amount of public land necessary to meet the proposed action's purpose is involved consistent with the standards referenced above.

**Steps Taken to Minimize Adverse Actions on Subsistence Uses and Resources**  
Chapter 2, displays the Standards and Guidelines and Mitigation Measures which will be implemented as part of the selected alternative. Most are designed to maintain fish and wildlife habitat productivity at as high a level as possible, consistent with meeting existing timber harvest contract commitments.

## Other Environmental Considerations

### Unavoidable Adverse Environmental Effects

Unavoidable adverse environmental effects are those effects resulting from resource use and development that cannot be effectively mitigated or avoided if the proposed action is to take place. Significant adverse consequences are eliminated or lessened through site planning, use of mitigation measures, and employment of standards or guidelines. These consequences are discussed earlier in this chapter. Remaining unavoidable consequences include: increased soil loss beyond naturally occurring levels; local and short-term reductions in water and air quality; alteration of natural landscapes; increased competition for subsistence resources; and the disturbance or loss of some wildlife habitat. The intensity and duration of these effects depends on the alternative and the mitigation measures applied to protect the resources.

Most unavoidable effects are expected to be mainly short term (usually less than two years). In all cases, the effects would be managed to comply with established legal limits, such as a maximum time for regeneration. In order to check and reduce these effects, monitoring procedures and mitigation measures have been planned for those areas that may be affected. Certain monitoring procedures and mitigation measures are required by existing standards or guidelines. Monitoring requirements established in the 1986-90 Operating Plan are to be found in Consolidated Appendix, Volume III, J. Specific mitigation measures for each harvest unit are included on the Unit Cards in Appendix A-1.

### Relationship Between Short-Term Uses and Long-Term Productivity

All alternatives would come under the mandate of the Multiple Use and Sustained Yield Act of 1960, which requires the Forest Service to manage National Forest lands for multiple uses, including timber, recreation, fish and wildlife, range, and watershed. All renewable resources are to be managed such that they are available for future generations. The harvesting and use of standing timber can be considered a short-term use of a renewable resource. As a renewable resource, trees can be reestablished and grow again if the productivity of the land is not impaired. To ensure adequate production of timber, harvest has been scheduled to allow the earliest cut stands to mature into merchantable timber before the planned harvest of original stands is complete. When the first rotation is complete, mature merchantable stands would be harvested again on a new rotation. Mitigation measures are planned under all the alternatives to ensure future availability of other renewable resources as well (Appendix A-1).

### Irreversible and Irretrievable Commitments of Resources

Nonrenewable resources would be committed under all of the action alternatives. These resources include energy resources and rock removed for road and facility construction. The No Further Harvest Alternative would not affect nonrenewable resources.

The action alternatives would result in some irretrievable losses, including some mature and overmature stands, wildlife habitat and primitive recreation opportunities. These losses are quantified for each alternative earlier in this chapter of the EIS.

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## **Possible Conflicts Between the Alternatives and Other Land Use Objectives**

The major land use regulations of concern are the Alaska Coastal Management Program and Section 810 of ANILCA. Portions of this project that directly affect the coastal zone have been evaluated and found to be consistent with the requirements of the Alaska Coastal Management Program. Refer to Appendix E of the 1986-90 FEIS for the Consistency Determination.

Under ANILCA, Section 810, agencies are required to evaluate the effects of proposed actions on subsistence uses of federal land and to determine if the proposed action significantly restricts subsistence opportunities. Refer to the Wildlife and Subsistence sections of this chapter for the evaluation of impacts to subsistence uses as a result of the alternatives.

## **Urban Quality, Historic and Cultural Resources, and the Built Environment**

Analysis Area 3 contains no urban areas and very little built-up area of any kind. Therefore, the only applicable concern under this topic is with historic and cultural resources. The goal of the Forest Service's Cultural Resource Management Program is to preserve significant cultural resources in their field setting and ensure they are available in the future for research, social/cultural purposes, recreation, and education. The direct and indirect effects of the alternatives on cultural resources have been evaluated and determined to meet the program goals.

## **Mitigation**

### **Mitigation Practices**

The Forest Service uses numerous mitigation, enhancement, and preventative measures in day-to-day practice (e.g., Forest Service Handbook on aquatic habitat management, Forest Service 1986a). These measures are employed for a variety of reasons such as fish and wildlife habitat protection or enhancement, protection of aesthetic values, prevention of landslides, prevention of windthrow, and timber stand improvement. In the 1986-90 FEIS, beginning on page 2-66, the standards, guidelines, monitoring, and mitigation measures were discussed in some detail, especially for measures that protect the fisheries resource, such as development of Aquatic Habitat Management Units.

The application of these measures begins during the planning phases of a project, links to the overall Forest, Chatham Area, and Ranger District management plans, and continues through all phases of subsequent forest management. The first objective is to foresee and avoid or prevent a potential problem in the planning phases. For example, roads are not planned for slopes steeper than 75 percent or on extreme hazard soils. Also, the Tongass Land Management Plan land use designations (LUDs) identified areas of the Forest with the highest amenity values and set them aside from timber harvest activities.

There are several stages of planning for a timber harvest unit. They get progressively more specific and culminate with on-site inspections by resource specialists who make final adjustments in the site plans prior to any construction activities. The adjustments may require leaving a stream buffer, or moving a harvest unit border to avoid a stream segment, reduce the likelihood of remaining timber blowing down, or reduce the effects on the visual resources. These final changes are recorded on the harvest Unit Cards that provide the specific requirements that must be followed to harvest that unit. Similar levels of planning for roads and other activities are also applied. Forest Service personnel also inspect the work of contractors to ensure compliance. Most of the mitigation measures to be used during the implementation phase and after the project are identified during the planning phases of a project. They may be modified as the project develops, however, due to varying field conditions, in order to best accomplish the intent of the standards and guidelines. Examples of mitigation measures are listed below. Specific application of the mitigation measures to individual units are listed on the Unit Cards in Appendix A-1. Discussion of the potential effectiveness of mitigation measures being proposed are also found with the Unit Cards.

*Logging Provides Jobs for Residents of Northeast Chichagof Island*



Mitigation measures include the following:

#### **Soils**

1. Suspend logs during yarding where needed to protect sensitive soils. This has proven effective elsewhere.
2. Insure that culverts are removed from temporary roads and water bars are installed to avoid resource damage. This has proven effective in Southeast Alaska.
3. Limit cut and fill slopes to 4 feet or less on "blue clay" soils. This has proven effective in other areas of Southeast Alaska.
4. Do not allow side casting of spoil material on mid-slope roads with steep side slopes. This has proven effective in Southeast Alaska.

#### **Timber Productivity**

1. Certify natural regeneration of stands within three to five years following harvest. This has proven effective in Southeast Alaska.
2. Schedule all harvested stands for precommercial thinning between 12 and 20 years of age. This is becoming a normal practice if budgets are not constrained.

#### **Wildlife**

1. Apply "state of the art" second-growth management techniques for areas of harvested deer winter range. Current techniques may include thinning and "gap management".

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While such techniques have proven effective in other locations, they are new to Southeast Alaska. It is still premature to judge their effectiveness.

2. Maintain and protect habitat for bald eagles.
  - Establish and maintain a minimum 100 meter radius habitat management zone around each eagle nest tree.
  - Maintain trees suitable for use by eagles for hunting, feeding, and perching.
3. For raptors other than eagles, protect any snag or tree containing an evident raptor nest. Prohibit management activities within 100 meters of any active raptor nest from May 1, to July 31 which would likely disturb the nesting birds.
4. Where feasible, retain snags to preserve adequate snag-habitat on a continuing basis consistent with safety standards.
  - Only designated snags will be left in cutting units.
  - Spike-top, high stumped, broken-topped, rotten, and other unmerchantable live or dead trees may be designated as snag-habitat.
  - Snags designated should be no less than 11 inches DBH and 15 feet in height.

## **5. Road Management Measures**

In addition to the mitigation measures discussed above that are mostly routine practices, several road management measures were evaluated for mitigation of impacts on wildlife and subsistence users. The brown bear habitat capability model used in projecting the effects of harvest and associated road access upon the brown bear indicates that roads may cause the greatest effect on brown bear habitat capability because of the increased likelihood of man/bear encounters and increased hunting access. Increased road access is of concern to the local subsistence hunters because they must increasingly compete with other hunters, especially for deer. Subsistence hunting areas have traditionally been accessed by boat, and the presence of new roads creates competition for subsistence hunters and a disadvantage to those without vehicles.

The potential for mitigating the effects of existing or new roads in Analysis Area 6 was evaluated based upon a range of opportunities. Seasonal or year-long road closure, entry by permit only (for individual roads or the entire road system) by administrative methods such as gating or signing was evaluated only as fair for potential effectiveness because of the remoteness of the locations and the difficulty of reasonable enforcement. Physically making roads impassable or designing roads to physically deny public access was evaluated as good for potential effectiveness for wildlife mitigation, but could generate public concern for recreation access and access for subsistence users. State regulatory authority opportunities for establishing seasons, bag limits, access permits, and licensing were evaluated as good for potential effectiveness in responding to wildlife and subsistence concerns, but are outside the Forest Service authority.

Mitigating the effects of timber harvest and associated road development upon the wildlife habitat and subsistence users is best done through a cooperative effort between the Forest Service, the State of Alaska, and the Native Corporations. While Forest Service roads typically are low standard roads and not suitable to all forms of public travel, most could provide access for recreation, subsistence uses, or other uses. In addition to protecting wildlife habitat and subsistence users, road management decisions will consider the economic costs associated with maintaining long-term access, the future uses that might occur within an area, the potential for providing a diversity of recreation opportunities, and the potential effects on fish habitat.

Based on the evaluation of mitigation opportunities, several mitigation measures were determined to be feasible and effective to varying degrees. Described below are several measures that are common to all alternatives.

- A. A road closure program would be implemented to reduce the vulnerability of bears to illegal and legal harvest. The road closure program will be jointly developed/implemented with ADF&G and all major parties affected. Road closures will reduce, but not eliminate vulnerability to bear harvest. The road closure program will consist of the following elements:
  - A public education program on road closures to be developed with the ADF&G.
  - A road closure enforcement program to be developed with ADF&G. Dual enforcement authority will be a priority.
  - Most closures will be for local roads with dead-ends within cutting units. The main roads that service larger areas of land generally are not affected.
  - Closures will be implemented by placing physical barriers on the roads to eliminate travel by four-wheeled drive vehicles. Barriers will include gates, piles of rock or logging slash, or ditches.
  - Closed road segments will remain open to travel by hiking.
  - In areas where the roads are closed, bridge construction will utilize modular spans which can be removed and used in other locations following sale operations.
- B. Jointly with ADF&G, the Forest Service will develop an educational program for logging and road construction camp operators and their personnel to, 1) reduce DLP kills of brown bears, and 2) explain Forest Service/ADF&G bear management programs. This program will be presented annually by ADF&G to all camp operators and personnel.
- C. The Forest Service, as a part of the community of Hoonah, will work with the community and all parties affecting to resolve bear/garbage problems. In addition, garbage incinerators will be in place and functioning in all camps prior to their opening.
- D. Road management options are presented by VCU in Table 4-48. Four access management options were considered: Option 1 would result in closure affecting none of the newly constructed and existing roads; Option 2 would result in closure affecting 75 percent; Option 3 would result in closure affecting 40 percent; and Option 4 would result in closure affecting 59 percent. Option 3 is the selected option.

### **Fisheries/Watershed**

As most fish habitat is included in Class I AHMUs, specific standards and guidelines of this class follow. Standards and guidelines for Class II and III Fish Habitat Units are generally less restrictive than for Class I. See the Aquatic Habitat Management Handbook (USDA Forest Service 1986a) for these standards and guidelines.

1. Maintain existing (natural) stream channel and bank conditions with specific reference to: stream width-to-depth ratio, pools and riffles (sequence, volume, and depth), and maintenance of 100 percent of undercut banks, stable debris, and other in-stream cover characteristics.
  - Directionally fall timber away from streamcourses (to include lining and jacking if necessary).
  - Split the yarding on the stream or fully suspend timber over the streamcourse.
  - Do not limb timber within or suspend over the streamcourse.

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- Remove all small, unattached debris less than 4 inches in diameter that is introduced into the streamcourse by human-related activity within 48 hours of its introduction.
  - Do not remove windthrow and inadvertently felled timber affecting the streamcourse unless it adversely impacts fish habitat (impact, positive or negative, will be determined by a fish biologist).
  - Leave standing all trees which affect streambank stability, including all deciduous and unmerchantable vegetation.
  - If significant areas of mineral soil are exposed, these areas will be grass seeded and fertilized within the first growing season.
2. Maintain average daily maximum summer temperatures below 58 degrees F. On streams with normal, daily summer maximum temperatures in excess of 58 degrees F, maintain average summer maximum temperature.

Table 4-48  
Road Management Options in Miles<sup>1</sup>

VCU	Existing Roads	Proposed Roads <sup>2</sup>	Option					
			1	2	3	4	Open	Closed
203	0	5.7		0	5.7		0	5.7
204	11.4	17.5		10.6	18.3		25.2	3.7
205 <sup>3</sup>	11.8	0		11.8	0		11.8	0
206 <sup>3</sup>	15.6	0		15.6	0		15.6	0
207 <sup>3</sup>	25.4	0		25.4	0		25.4	0
208	3.5	0		0	3.5		3.0	0.5
209	14.5	2.5		0	17.0		7.3	9.7
210	13.5	11.6		0	25.1		9.5	15.6
211	0.0	3.6		0	3.6		0	3.6
212	6.5	11.0		0	17.0		4.8	12.2
213	1.0	6.1		0	7.1		0	7.1
214	0.8	5.4		0	6.2		0	6.2
215	15.9	5.0		0	16.4		6.9	9.5
216	8.1	0		0	8.1		0	8.1
217	9.3	1.6		0	10.9		7.5	3.4
218	26.3	0.0		0	26.3		16.1	10.2
219	1.9	7.2		0	9.2		4.8	4.4
220	12.7	0		0	12.7		1.5	11.2
221	0	0		0	0		0	0
Total	178.2	77.2		63.4	187.1		145.1	105.4
							103.8	146.7

SOURCE: SEIS Planning Record.

<sup>1</sup> No roads would be closed under option 1. Options 2, 3, and 4 would close various proportions of the roads. See Appendix C-2 of the Phase II Draft SEIS for Analysis Area 3 for a more detailed breakdown of specific road closures.

<sup>2</sup> Roads that would be built under the no action - current direction alternative.

<sup>3</sup> Roads on Native lands.

- Streams with known excessive temperatures should have no timber harvest adjacent to the stream that would reduce critical stream shading.
  - Along streams not known to be temperature sensitive but which have potential to be:
    - Retain at least 75 percent of the shade producing vegetation next to the stream during each timber harvest entry.
    - Limit timber harvest within each timber harvest unit on the southern, southwestern, southeastern, and western sides of streams to 660 linear feet. Harvest along other aspects should be limited to 1300 linear feet per unit.
    - Retain all standing vegetation less than 12 inches DBH within the AHMU whenever possible.
3. Maintain the natural migration routes of adult and juvenile anadromous and high-quality resident sportfish.
- Provide passage for adult pink and chum salmon in all cases.
  - Provide passage for all other species on all streams with natural stream gradients of 4 percent or less, using typical designs for bridges or culverts installed at a grade of 1 percent or less. For streams with gradients steeper than 4 percent, evaluate the potential trade-off between the loss of rearing fish production and the cost of providing rearing fish passage. The 4-6 percent gradient stream reaches are especially critical since standard culvert design cannot be implemented to provide fish passage. Thus, fish passage involves open-bottom structures, baffled culverts or other non-standard structures which are much more costly than standard designs. See the Aquatic Habitat Management Handbook (USDA Forest Service 1986a) for trade-off comparison method.
4. Maintain water quality for the propagation of fish , shellfish, and other aquatic life as defined by the State of Alaska, Water Quality Standards, (amended February 1979).
- Culverts should be properly bedded to prevent undermining and eroding seepage and should utilize energy pools or other dissipating techniques at the outfall.
  - Stream crossings should be located where switchbacks and bridge approaches would not create drainage problems.
  - Bridge abutments should be designed to minimize disturbance to streambanks.
  - Areas of exposed mineral soil should be revegetated during the first growing season following exposure.
  - Timber harvest settings that cross streams are undesirable. Where unavoidable, they should be located to permit practical yarding techniques that minimize adverse impacts. Techniques that have been found acceptable include, but are not limited to:
    - Right angle crossings
    - Full suspension yarding
    - Minimize use of equipment in streams.
    - Natural filter strips should be left where necessary to filter the sediment carried by water flowing from disturbed areas such as roads, landings, and sort yards
5. Provide, in perpetuity, future sources of large organic debris (LOD) to aquatic habitats while maintaining and/or enhancing quantities of existing instream debris.
- Provide for future sources of LOD.

# **4 Environmental Consequences**

- Retain trees that cannot be directionally felled away from stream or those that would result in serious impacts to the AHMU.
- Do not remove suspended LOD over the stream.
- Retain trees for LOD on both sides of the stream if both sides are proposed for harvest.
- Coordinate future sources of LOD with second-growth management program.
- Trees which should be left within 75 ft. of the stream include: 1) all deciduous trees, 2) all conifer trees less than 12" DBH, 3) all snags, 4) coniferous trees of all sizes with a 10% or greater lean over the stream, and 5) other large coniferous trees as needed for future sources of LOD.
- Trees that are felled into or across streams should be left in place. Unattached small debris (less than 4" diameter) shall be hand removed within 48 hours.
- Trees preferred for retention, based upon length of their expected useful life as LOD, are prioritized as follows: 1) cedar, 2) spruce, and 3) hemlock. A mix of species is preferred, however, and should be maintained whenever possible.
- Maintain instream debris by:
  - Not salvaging windthrown trees suspended over the stream or on the streambanks unless specifically designed for fish habitat enhancement on a case-by-case basis.
  - Not removing existing (natural) instream debris.
- Increase primary and secondary biological production in streams without adversely affecting juvenile salmonid habitat.
- Mixed stands along streams with gradients between 0 and 6 percent, can normally be precommercially thinned to the streambank edge.
- Alder immediately adjacent to the stream should be managed to provide 75 percent shade on the stream.
- Priority for precommercial and commercial thinning should be given to stands along streams which could benefit from such activity over stands not adjacent to streams.
- All streamside vegetation along streams with gradients between 0 and 6 percent should be managed to keep daily maximum water temperatures below 58 F. while opening the stream to sunlight.
- Complete canopy removal treatments should only be used along stream sections with abundant instream cover or along streams which are not temperature sensitive (see guidelines for temperature sensitivity in AHMU Handbook).

## **Recreation**

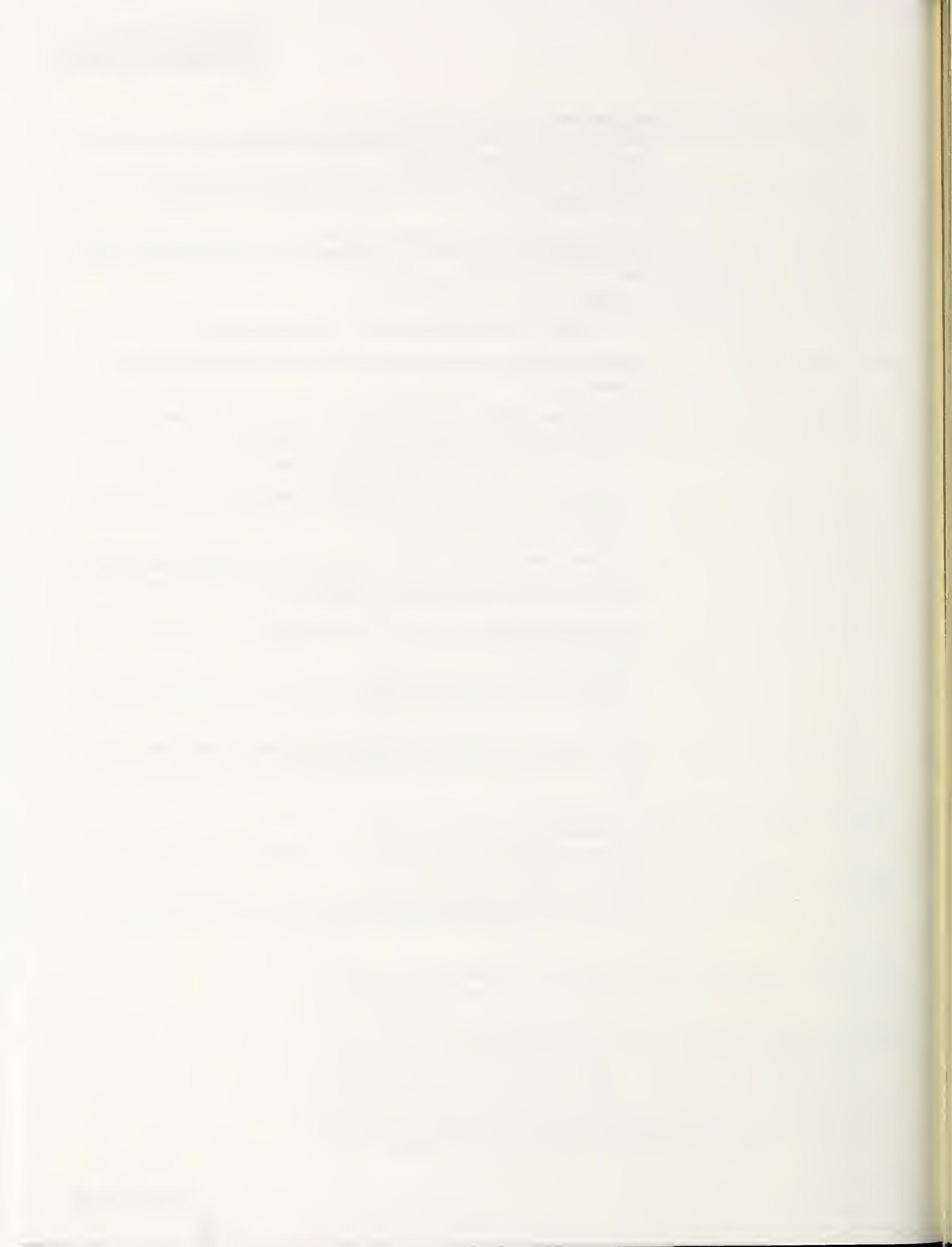
1. Monitor cabin use to determine if future access needs to be restricted. If cabin use significantly increases, restricting access is an effective method to maintain primitive recreational opportunities.
2. Provide trail sign to direct recreation traffic on trails. This has proven effective in maintaining recreation opportunities in other locations and should be equally effective in Analysis Area 3.
3. Reconstruct trail heads at road crossings, if necessary, to provide continued access. Since this has proven effective in maintaining recreational access on forests in the lower 48 states, it is reasonable to assume it would be equally effective here.

**Visual Resources**

1. Create irregular unit boundaries on visually sensitive units. This has proven effective on other harvest units in Southeast Alaska.
2. Design rockpits to eliminate visibility to saltwater travelers. This has proven effective in Southeast Alaska.
3. For VQO of Partial Retention: Design activities to be subordinate to the landscape character of the area. This VQO should be accomplished within one year of project completion.
  - Facilities:
    - Emphasize enhancement of views both to and from the facility.
  - Use colors found in the natural environment while considering seasonal variations.
  - Transportation:
  - Design rock sources to not be seen from sensitive travelroutes. Rehabilitation plans will be necessary following closure of rock source developments.
    - Temporary LTF: Develop rehabilitation plan at the close of LTFs life.
    - Permanent LTF: Landscape architect should be involved in all stages of LTF planning and design. Low profile designs should be considered so as to minimize visibility from adjacent travel routes.
4. For VQO of Modification: Activities may visually dominate the original characteristic landscape. This VQO should be met within one year in the foreground distance zone and within five years in the middle and background distance zones.
  - Utilize naturally established form, line, color, and texture found in the landscape when planning activities.
  - Facilities: Siting and design should borrow from naturally occurring patterns in the landscape, and should not visually dominate when viewed in the background distance zone.
5. For VQO of Maximum Modification: Area may be dominated by management activities. Design activities to resemble natural occurrences as viewed in the background distance zone.

**Cultural Resources**

1. Avoid known cultural sites. This has already been negotiated with the State Historical Preservation Officer.
2. A cultural resource specialist on the forest will survey those sites proposed for harvest that have not been previously surveyed for archeological resources prior to harvest.



# **Chapter 5**

## **List of Preparers**



# Chapter 5

## List of Preparers

### US Forest Service

**Theodore Allio**, Transportation Planner

Certificate, Transportation Analysis, Oregon State University  
Certificate, Logging System Analysis, Oregon State University

Forest Service: 20 years  
Transportation Planner, Tongass National Forest (12 years)

**Gordon Anderson**, Chatham Area Timber Planner

B.S., Forestry Management, Utah State University, 1971

Forest Service: 25 years  
Assistant Interdisciplinary Team Leader, Forest Plan, Siskiyou National Forest  
Timber Management Assistant, Ochoco National Forest (5 years)  
Working on five National Forests and two separate regions

**Robin Bergey**, Cartographic Support

B.A., Anthropology and Earth Science, University of Northern Colorado, 1978

Forest Service: 7 years  
Cartographic Technician, Tongass National Forest, Chatham Area (1 year)  
Engineering Draftsman, Tongass National Forest, Chatham Area (2 years)  
Personnel Clerk, Tongass National Forest, Chatham Area (2 years)  
Archeology Technician, Tongass National Forest, Chatham Area (2 years)

Other Employment:

Denver Museum of Natural History  
University of Colorado Museum  
Owner, Kasnyku Studies (photography, drafting, graphics) (6 years)

**Norene Blair**, Writer/Editor/Forester

B.A., Planning and Administration, University of Oregon, 1968  
M.A., Planning and Administration, University of Oregon, 1970  
M.S., Forest Management (Silviculture), University of Idaho, 1977  
Pre-doctoral Studies, Forest Entomology, University of Idaho

Forest Service: 12 years

Land Use Coordination, Columbia River Gorge National Scenic Area  
Writer/Editor/Indexer - Detailer - Ochoco, Siskiyou, and Malheur National Forests (2 years)  
Forester, Sale Planner/Logging Systems Specialist, Burns Ranger District  
Malheur National Forest (2 years)  
Environmental Coordinator, Burns Ranger District (3 years)  
Forester/Data Base Specialist, Planning Team, Malheur National Forest (4 years)

Other Employment:

Instructional Assistant, Resource Economics, University of Idaho (3 years)

**Helen Clough**

B.A., Anthropology, 1973

Forest Service: 8 years

Public Affairs, Tongass National Forest, Chatham Area (2 years)

Line Management, Tongass National Forest (4 years)

Land Management Planning, Tongass National Forest (2 years)

Other Employment:

Natural Resources Management (2 years)

Archaeology (6 years)

**Jon Cummins, Computers/Engineering**

B.S., Mathematics, Northern Arizona University, 1973

Civil Engineering, Northern Arizona University, 1978

Forest Service: 15 years

Civil Engineer, Tongass National Forest, Regional Office (6 months)

Civil Engineer, Tongass National Forest, Ketchikan Area (7 years)

Civil Engineer, Coconino National Forest, Flagstaff, Arizona (7.5 years)

**Stanley D. Davis, Forest Archeologist**

B.A., Anthropology, University of Northern Colorado

M.S., Social Science/Archeology, University of Northern Colorado

Forest Service: 11 years

Forest Archeologist, Tongass National Forest, Chatham Area

Other Employment:

Instructor - University of Alaska, Juneau (1 year)

Instructor - Islands Community College, Sitka, Alaska (2 years)

Assistant State Archeologist, Utah (1 year), Independent Contractor - Archeology (2 years)

Assistant Director, Sonora Archeological Program (2 years)

Teaching Assistant, Anthropology Department, University of Northern Colorado (1 year)

**Ronald M. Dippold, Forester**

B.S., S.U.N.Y. College of Forestry, 1958

Graduate Work in Statistics and Forest Administration, 1966-1967

Graduate Work in Public Administration

Forest Service: 25 years

Timber Management, Inventory, Plans, Silviculture, Budget, and Appeals, Regional Office, Alaska Region (12 years)

Forester, Forest Inventory and Research, Pacific Northwest Forest and Ranger Experiment Station, Juneau, Alaska (12 years)

District Assistant for Range, Wildlife, and Lands, Ochoco National Forest

Range Survey and Mapping, Timber Sale Administration, and Mining Claims, Ochoco National Forest

Silviculture and Fire Control, Ochoco National Forest

**Ted Falkner, Civil Engineering Technician**

Civil Engineering, Humboldt State University, 1959

Forest Service: 30 years  
GIS Coordinator (2 years)  
Planner (5 years)  
Engineering (23 years)

**William F. Fieber, Logging Systems and Transportation Systems**

B.S., Forest Management, University of Minnesota, 1973  
M.F., Forest Engineering, Oregon State University, 1976

Forest Service: 25 years  
Transportation Planner, Tongass National Forest, Chatham Area (1 year)  
Regional Logging Engineer, Timber Management, Region 5 (8 years)  
Forest Logging Engineer, Olympic National Forest (3 years)  
Advanced Logging Systems Program, Oregon State University (2 years)  
Management Plans Forester, Mendocino National Forest (4 years)  
TMA Plans, McCloud Ranger District, Shasta-Trinity National Forest (3 years)  
Pre-Sale Forester, Olympic National Forest (4 years)

**Other Employment:**

Lecturer, School of Forestry, University of Canterbury, New Zealand (1 year)

**Susan Gorder, Civil Engineering Technician**

A.A., Civil Engineering Technology, American River College, 1982

Forest Service: 3 years  
GIS Staff, Tongass National Forest, Chatham Area (1 year)  
Engineering, Tongass National Forest, Juneau Ranger District (1 year)

**Robert H. Huecker, Soil Scientist**

B.S., Resource Management, University of Wisconsin-Stevens Point, 1976

Forest Service: 11 1/2 years  
Soil Scientist, Chucagh National Forest (5 1/2 years)  
District Soil Scientist, Thorne Bay Ranger District, Tongass National Forest (3 1/2 years)  
Soil Scientist, Tongass National Forest, Chatham Area (2 1/2 years)

**Other Employment:**

Soil Conservationist, Dunn County Soil and Water Conservation District, Menomonie, Wisconsin (15 months)

**Charles Kosak, Transportation Planner**

Forest Service: 19 years  
Survey and Road Design, Shasta Trinity National Forest (6 years)  
Transportation Planner, Idaho Panhandle National Forest (1 year)  
Transportation and Logging Systems Planning, Shasta Trinity National Forest (11 years)  
Transportation Planning, Tongass National Forest (1 year)

**Lyle Krueger, Cartographic Technician and Consultant**

Forest Service: 14 years

Geometronics, Cartographic Technician and Special Maps, Regional Office, Alaska Region (8 years)

Cartographic Technician and Primary Base Geometronics, Service Center (4 years)

Cartographic Technician and Primary Base Geometronics, Regional Office, Region 9 (4 years)

Engineering Technician, Regional Office, Region 9 (2 years)

**Annemarie Lafaline, Forester Interdisciplinary Team Member**

B.S., Oregon State University, 1980

Forest Service: 8 years

Presale - Sitka Ranger District, Chatham Area (8 years)

Timber Sale Planner - Mt. Hood National Forest

**Marilynne E. Lawson, Cartographic Technician**

Forest Service: 13 years

Cartographic Technician, Regional Office, Alaska Region (8 years)

Cartographic Aid/Technician, Region 6 (5 years)

Other Employment:

Cartographic Technician, U.S. Bureau of Mines (5 years)

**Nels H. Lawson, Database Management**

Electronics, Foothill College, 1976

Engineer in Training, 1977

Forest Service: 9 years

Engineering Budget/Engineering Computer Specialist, Tongass National Forest, Chatham Area (8 1/2 years)

Transportation Planner, Tongass National Forest, Chatham Area (6 months)

**Gary Lehnhausen Wildlife Biologist Interdisciplinary Team Member**

B.S., Utah State University, 1972

Forest Service: 18 years

Wildlife Biologist - Tongass National Forest, Chatham Area

Zone Wildlife Biologist - Sierra National Forest

**R. Michael Martin, Economist**

B.A., Economics, University of California, Santa Barbara, 1973

M.S., Economics, University of Oregon, 1979

Ph.D., Economics, University of Oregon, 1981

Other Employment:

Finance and Administration Officer, United Nations, Rome, Italy (3 years)

Economist, Bureau of Land Management (6 years)

Private Consultant (4 years)

Local Government Planner, Roseburg, Oregon (1 year)

**Domenick J. Monaco, Landscape Architect**

B.S., Landscape Architecture, Pennsylvania State University, 1972

Forest Service: 8 years

Landscape Architect, Tongass National Forest, Chatham Area

Other Employment:

Landscape Architect, U.S. Army Corps of Engineers (2 years)

Landscape Architect, GWSM, Inc. (7 years)

**Philip W. Mooney, Wildlife Biologist**

B.S., Wildlife Management, Utah State University, 1972

Forest Service: 19 years

Forestry Technician, Bridger National Forest (9 years)

Wildlife Biologist, Dixie and Fishlake National Forest (3 years)

Interdisciplinary Wildlife Biologist, Bridger-Teton National Forest (6 years)

Wildlife Biologist, Okanogan National Forest

Vegetation Management and Nursery Management EIS Team member, Region 6 (1 year)

Other Employment:

Environmental Consultant, Boise, Idaho (2 years)

**John B. Morrell, Lands Forester**

B.S., University of Montana, 1967

M.S., Forestry, California State University, Humboldt, 1976

Master of Forest Resources, Outdoor Recreation Emphasis, University of Washington

Forest Service: 15 years

Lands Forester, Tongass National Forest, Chatham Area (4 years)

Resource Assistant, Thorne Bay Ranger District, Tongass National Forest, Ketchikan Area (2 years)

Resource Assistant, North Prince of Wales Ranger District, Tongass National Forest, Ketchikan Area (1.5 years)

Forester/Recreation Assistant, Packwood Ranger District (3.5 years)

Research Assistant, Pacific Northwest Forest and Range Experiment Station, Seattle

**Mary Beth Nelson, Recreation Planner**

B.S., Recreation Area Management, Montana State University, 1979

Forest Service: 8 years

Recreation Planner, Tongass National Forest, Chatham Area, (4 months)

Architectural Technician, Chatham Area, Tongass National Forest (5 years)

Architectural Technician, Kootenai National Forest (2.5 years)

**Dave Niemann, Cartography Section Supervisor**

B.S., Wildlife Management, Utah State University

B.S., Biological Sciences, Utah State University

Masters Biological Sciences Education, Utah State University

Forest Service: 10 years

Geometrics Cartography Section Supervisor, Regional Office, Alaska Region

Other Employment:

Digital Land Mass Simulation - Production Section Supervisor, Imagery Analysis Techniques Office

Defense Mapping Agency, Aerospace Center, St. Louis, Missouri

**Henry W. Newhouse, Fisheries/Wildlife/Subsistence/Mitigation**

B.S., Fisheries Biology, Humboldt State University, 1972  
Fisheries Biology, Graduate Studies, Humboldt State University

Forest Service: 14 years

Fisheries Biologist, Wildlife and Fisheries Staff, Regional Office, Alaska Region (7 years)  
Forest Fisheries Biologist, Nezperce National Forest (3.5 years)

Forest Fisheries Biologist, Kootenai National Forest (2 years)

District Wildlife/Fisheries Biologist, Warner Mountain Ranger District, Modoc National Forest (1.5 years)

Other Employment:

Graduate Fellowship, California Cooperative Fisheries Unit, Humboldt State University, 2 years

**Steve Paustin, Hydrologist, Interdisciplinary Team Member**

B.S., Colorado State University

M.S., Forest Hydrology, Oregon State University

Forest Service: 11 years

Research Assistant, Oregon State University

Forest Hydrologist, Chatham Area

**Kathy Peterson, GIS Support**

B.A., History, Washington State University, 1971

Forest Service: 10 years

Civil Engineering Technician (Transportation Planning), Tongass National Forest, Chatham Area (1 year)

Civil Engineering Technician (Road Design and Construction Inspection) Okanogan National Forest (8 years)

**James Pierce, SEIS Team Leader**

B.S., Forest Engineering, Oregon State University, 1966

Forest Service: 17 years

District Ranger, Willamette National Forest and Mt. Hood National Forest (5 years)

Group Leader for Planning, Regional Office, Alaska Region (3 years)

Planning Staff, Ochoco and Umpqua National Forests (3 years)

Logging Engineer, Ochoco National Forest (1 year)

Misc. Forester Positions on Willamette and Mt. Hood National Forests (5 years)

Other Employment:

Consulting Forest Engineer (1 year)

General Manager, Sawmill (2 years)

**Dennis J. Rogers, Environmental Coordinator**

B.S., Geology, Kent State University, 1968

M.S., Geology, Kent State University, 1974

Forest Service: 13 years

Willamette National Forest (2 years)

Siuslaw National Forest (2 years)

Tongass National Forest (2 years)

**Miller T. Ross, Timber Staff Officer, Chatham Area**

B.S., Forestry, Michigan State University, 1961  
B.S., Education, Chadron State College, Nebraska, 1972

Forest Service: 23 years

Timber Staff Officer, Tongass National Forest, Chatham Area  
Timber Staff Officer, Routt National Forest (7 years)  
Forester, Region 2, Medicine Bow, Rio Grande, Bighorn, and Routt National Forests

Other Employment:

Public School Teacher 1970-1972 in Bushnell, Nebraska School System

**James Russell, Silviculturist**

B.S., Forestry, University of Minnesota, 1970

Forest Service: 7 years

Forester/Silviculturist, Tongass National Forest, Chatham Area (3 years)  
Forester, Regional Office, Milwaukee, Wisconsin (2 years)  
Forester, Chippewa National Forest, Cass Lake, Minnesota (7 years)  
Forester, Tongass National Forest, Petersburg, Alaska (6 years)

**John C. Sherrod, Process Review and Oversight**

B.A., Forestry, University of Georgia, 1960

M.S., Forest Resources, University of Idaho, 1980

Forest Service: 27 years

Experience on seven National Forests in three Forest Service Regions. Positions include  
Planning Staff Officer (three Forests), Planning Team Leader (three Forests), District  
Ranger, and District Staff (four Ranger Districts).

**Glen Stein, Chatham Area IDT Timber Planner**

B.A., Forestry, Humboldt State University, 1978

Forest Service: 10 years

Forester, Tongass National Forest, Chatham Area (4.5 years)  
Forester, Tonto National Forest (2.5 years)  
Forester, Santa Fe National Forest (1.5 years)

**Karen Swanson-Iwamoto,**

B.A., Anthropology, Oregon State University, 1979

B.A., History, Oregon State University, 1979

Forest Service: 7 years

Archaeologist, Chatham Area (6 years)

**Gary Van Hine,**

A.S., Forestry, Sheldon Jackson College, Sitka, Alaska

Forest Service: 12 years

Civil Engineering Technician, Tongass National Forest, Chatham Area (11 years)  
Forestry Technician, Tongass National Forest, Chatham Area (1 year)

**Kenneth D. Vaughan**, Engineering Transportation Planner

B.S., Civil Engineering

M.S., Civil Engineering with Industrial Engineering Minor  
Predoctoral Studies: Civil and Industrial Engineering

Forest Service: 17 years

Other Employment:

Part-time Instructor, University of Alaska (7 years)

**John Warner**, Logging Engineer

B.S., Forestry, Oregon State University, 1955

Logging Engineering Program, Pacific Northwest Forest and Range Experiment Station

Forest Service: 29 years

Regional Logging Engineer, Regional Office, Alaska Region

Logging Engineering Staff, Regional Office, Pacific Northwest Region

Assistant Timber Staff, Six Rivers National Forest, California Region

Engineering Technician (GS-11) California Region

**Richard R. Zaborske**, Forester

B.S., Forest Management, University of Wisconsin-Stevens Point, 1977

U.S.D.A. Forest Service Certification, Silviculture, 1985

Professional Certification, Soil Science, 1986

M.F. Forest Engineering, Oregon State University, 1989

Forest Service: 12 years

Interdisciplinary Team Forester, Tongass National Forest, Chatham Area (6 months)

Zone Silviculturist, Lincoln National Forest (5 years)

Soil Scientist, Prescott National Forest (3 years)

**Elsan Zimmerly**, Photographic Coordinator, Writer/Editor

B.S., Forestry Recreation, Colorado State University, 1984

Country School of Photography, Vermont

Forest Service: 4 years

Writer/Photographer, Regional Office, Alaska Region (2 years)

Naturalist, Alaska Region (2 years)

Photographic Coordinator; Begich, Boggs Vistor Center, Portage, Alaska

Other Employment:

Instructor of Photography, Experimental Learning Program, Colorado State University  
(6 years)

Writer/Photographer; Poudre Magazine, Triangle Review, Choice Magazine, Fort Collins,  
Colorado.

Freelance Writer/Photographer (15 years)

## Dames & Moore

**Janine C. Blaeloch**, Technical Writer/Editor/Environmental Planner

Landscape Architecture, University of Washington

B.A., Environmental Studies, University of Washington, 1989

Dames & Moore: <1 year

Environmental Analysis

Technical Writing

**A. David Every**, Project Team Leader/Senior Terrestrial Ecologist

B.S., Zoology, University of Utah, 1967

M.S., Botany, University of Utah, 1969

Ph.D., Botany, University of Washington, 1977

Dames & Moore: 1 year

Project Manager

Environmental Impact Assessments

Habitat Evaluation Procedure

Wetlands/Terrestrial Ecology

Other Employment:

Envirosphere Company, Terrestrial Ecologist (5 years)

NUS Corporation, Terrestrial Ecologist (3 years)

Principal Investigator in various consulting capacities (1 year)

**Deborah J. Flynn**, Technical Writer/Editor/Coordinator/Environmental Planner

B.S., Natural Resource and Recreation Planning and Forestry, Oregon State University, 1984

M.S., Natural Resource Economics, University of Arizona, 1986

Dames & Moore: 2 years

Natural Resource Economics

Technical Writing

Public Relations

Other Employment:

U.S. Forest Service (3 years)

**Phillip J. Leapley**, Technical Writer/Coordinator/Terrestrial Ecologist

B.S., Biology, Washington State University, 1977

M.S., Environmental Science, Western Washington University, 1980

Dames & Moore: 1 year

Habitat Evaluation

Mitigation Planning

Environmental Impact Statements

Permit Applications

Property Transfer Site Assessments

Other Employment:

Hosey and Associates, Project Ecologist (2 years)

RW Beck and Associates, Project Ecologist (2 years)

Washington State Department of Transportation, Environmental Planner (1 year)

GPA Consulting Services, Biological Consultant (3 years)

**Douglas J. Martin, Technical Writer/Senior Biologist**

B.S., Water Resource Management and Pollution Ecology, University of Washington, 1971  
M.S., Fisheries Biology and Aquatic Ecology, University of Washington, 1976  
Ph.D., Fisheries Science and Salmonid Ecology, University of Washington, 1985

Dames & Moore: 2 years  
Environmental Impact Assessments  
Managing and Conducting Baseline Studies  
Project Manager--Salmonid Ecology and Fisheries Biology, Fish Habitat Restoration and Enhancement

Other Employment:  
Envirosphere Company, Senior Scientist (4 years)  
Independent Consultant (7 years)  
University of Washington Fisheries Research Institute, Fisheries Biologist (7 years)

**Robin Scheid, Technical Writer/Coordinator/Editor/Marine Biologist**

B.S., Marine Biology, Davidson College, 1986

Dames & Moore: 1 year  
Technical Writing  
Marine Biology Field Technician  
Oceanography Field Technician

Other Employment:  
National Marine Fisheries Service, Fisheries Biologist (2 years)  
Schooner, Inc., Marine Biologist (1 year)

**Kathryn J. Stenberg, Technical Writer/Editor/Coordinator/Wildlife Ecologist**

B.A., Biology - Environmental Studies, Whitman College, 1980  
M.Admin., Environmental Administration, University of California, Riverside, 1982  
Ph.D., Wildlife and Fisheries Sciences, University of Arizona, 1988

Dames & Moore: <1 year  
Environmental Impact Assessments  
Habitat Evaluation  
Technical Writing

Other Employment:  
University of Arizona, Research Associate (5 years)  
King County Building and Land Development Division, Utilities Planner (1 year)  
University of California, Riverside, Research Associate (2 years)

**Gail Thompson**, Technical Writer/Coordinator/Editor/Senior Environmental Scientist

B.A., Anthropology, University of Washington, 1969

M.A., Anthropology, University of Washington, 1971

Ph.D., Anthropology, University of Washington, 1978

Dames & Moore: 3 years

Managing and Conducting Hazardous Waste Assessments

Senior Project Manager

Senior Archeologist

Senior Environmental Analyst

Senior Anthropologist

Other Employment:

Hart Crowser, Inc., Cultural Resources Specialist (2 years)

The Earth Technology Corporation, Manager of Cultural Resources Services (6 years)

Shannon and Wilson, Inc., Staff Archeologist (1 year)

University of Victoria, Visiting Lecturer (1 year)

Wilke-Thompson, Partner (4 years)

University of Delaware, Anthropology Instructor (1 year)

## **Photo Contributors**

Alaska Pulp Corporation

Alaska Department of Fish & Game

Alaska State Library

Jan Albayalde

George Figdor

Elaine Loopstra

Steve Paustin

Elsan Zimmerly



# **Chapter 6**

**List of Agencies,  
Organizations, and  
Persons to Whom  
Copies of this  
Statement Were Sent**



# Chapter 6

## List of Agencies, Organizations, and Persons to Whom Copies of this Statement Were Sent

Name	Organization
Don Cornelius	Alaska Dept. of Fish & Game
Jack Gustafson	Alaska Dept. of Fish and Game
R.Larson & J.Edgington	ADF&G, Commercial Fisheries
Don Ingledue	ADF&G, Commercial Fisheries
Gregory Thomason	ADF&G, Commercial Fisheries
Robert Schroeder	ADF&G, Subsistence Division
R.Bosworth & B.Schroeder	ADF&G, Subsistence Division
Don Cornelius	ADF&G, Habitat Division
Dave Hardy	ADF&G, Habitat Division
R.Reed & L.Shea	ADF&G, Habitat Division
Jeffrey Hughes	ADF&G, Nongame
S.Elliott & M.Schwann	ADF&G, Sport Fisheries Division
F.Gaffney & M.Bethers	ADF&G, Sport Fisheries Division
Artwin Schmidt	ADF&G, Sport Fisheries Division
	ADF&G, Game Division
E.L. Young	ADF&G, Wildlife Conservation Division
D.Anderson & M.Kirchoff	ADF&G, Wildlife Conservation Division
David James	ADF&G, Wildlife Conservation Division
Rod Flynn	ADF&G, FRED Division
	Agr. Stabilization & Cons.
Dick Tsuru	AK PAC, Trading Co.

Name	Organization
Vance Sanders	Alaska Legal Services Corp.
Walter Pasternak	Alaska Legal Services Corp.
	Alaska Troller's Association
	Alaska Native Brotherhood
	Alaska Miners Association
	Alaska Pulp Corporation
Frank Ropell	Alaska Pulp Corporation
	Alaska House Resource Committee
	Alaska Senate Resource Committee
	Alaska Federation of Natives
E. O. Bracken	Alaska Miner's Association
Richard Myren	Alaska Biological
Dave Sturdevant	Alaska Dept. Of Environmental Conservation
Jonathan W. Scribner	Alaska Dept. of Transportation/Public Facilities
Documents Librarian	Alaska State Library
Earl Krygier	Alaska Trollers Assocation
Rep. Kayn Wallis	Alaska State Legislature
Sally Coady	Alaska Women in Timber
Gregory Head	Alaska Timber Corporation
Diane Mayer	State of Alaska/OMB-DGC
Art Kennedy	ALUC, Land Use Advisory Comm.
Craig Lindh	ALUC, Staff,Comm. Part./OMB-DGC
Office of the Fed Cochairman	ALUC
Wayne Ross, Esq.	ALUC, Land Use Comm., Dec
Ron McCoy	ALUC, Staff AK Land Use Council
	Anchorage Municipal Libraries
Jim Labau	Anchorage Forestry Science Lab
Alaska Collection	Anchorage Municipal Libraries
	City of Angoon
Dave Rose	Angoon High School
K.J. Metcalf	Angoon Trading Company
	Angoon Community Association
	Angoon Public School
George Jim, Sr.	Angoon Advisory Committee
Lee L. Antrim	Antrim Associates

<b>Name</b>	<b>Organization</b>
Richard Ogar	Arco Alaska, Inc.
Dr. George Snyder	Auke Bay Lab.
Tom L. Pittman	Bureau of Mines
Avrum Gross	Bureau of Land Management
Warrcn Pellett	Chatham Cannery Partnership
Larry Bcck	Chec - Forest Watch
Phil R. Holdsworth	Chevron Marina
Sen. Bettyc Fahrenkamp	Chilkoot Lumber Co.
Mary Lucile Born	Citizen's Advisory Commission
Jeannette Konoske	Citizen's Advisory Committee
	Commissioner Dept. Nat. Resources
	Cooke Cablevision
	Craig Public Library
	Credit Bureau of Sitka, Inc.
J. Sonnenfeld	Dames & Moore
Douglas Public Library	Department of Geography
Jim Mc Allister	c/o Juneau Memorial Library
Peggy Simons	Div. of Land & Water Management
Dr. Helen Mc Cammon	Div. Of Forestry
Bob Mourant	Division of Public Services
Greg Howe	Ecological Research Division
Patrick Ahtey	Elfin Cove Advisory Committee
	Elfin Cove Advisory Committee
	Elfin Cove Advisory Committee
	ENSR
	Environmental Protection Agency
	Esther Greenwald Public Library
Clare Doig	Fairbanks Public Library
Russel Bartoo	Foresters and Managers, Inc.
Nick Yurko	Gastineau Channel Advisory Committee
	Gastineau Channel Advisory Committee
	General Services Administration

Name	Organization
Marvin O. Jensen	Glacier Bay National Park
J. & M. Rosenbruch	Glacier Guides
	Haines Borough Public Library
Robert L. Hames	Hames Corporation
Robert C. Prefontaine	High Drive Drilling
	City of Hoonah
Liv C. Gray, Mayor	City of Hoonah
Al Hill	Hoonah Advisory Committee
Gordon Pederson	Hoonah Advisory Committee
Wanda Culp	Hoonah Indian Association
	Huna-Totem Corporation
	Hydaburg School District
	Irene Ingle Public Library
	Irene Ingle Public Library
	Island News
	Juneau Chamber of Commerce
	Juneau Memorial Library
M.J. Bishop	Kaiser Cement Corp./Mineral Res
	Kake Tribal Corporation
	Kake City Office
	Kake City Community/School Lib.
Ken Mears	Katnai Sportfishing Guides
Steve Connelly	Ketchikan Pulp Co., Thorne Bay
	Ketchikan Daily News
	Ketchikan Public Library
	Kettleson Memorial Library
Jo Ann Ross	KHNS Radio
Don Fleeman	KIFW-Radio
	Klawock Heenya Corporation
Robert Loiselle	Klukwan Forest Products, Inc.
Walter A. Soboloff	Kootznoowoo Corporation
Ethel Bergman	City of Kupreanof
Rhonda Lichtwake	KSTK-FM

Name	Organization
Carl A. Newport	Marine Mammal Commission
Don Brown	Mason, Bruce & Girard, Inc
Steve Pennoyer	Mendenhall Valley Public Library
DR. K. Koski	Mud Bay Logging Company
Sonia Naubaver	National Marine Fisheries Service
	NMFS, Auke Bay Lab
	News Director, KFSK
	Office of Environment Review
	City of Pelican
	Pelican Public Library
	Pelican Public Library
	City of Petersburg
	Petersburg Public Library
Sig Mathisen	Petersburg Vessel Owners Assoc. Clyde Curry
	Petersburg Advisory Committee
	Petersburg Pilot
Bob Tkacz	Petersburg Pilot
	City of Port Alexander
	City of Port Alexander
William E. Odell	Planning Commission
Becky Gay	Resource Development Council
James Clark	Robertson,Monagle,Eastaugh & Bradley
Greg Minor	Saltman and Stevens
John Fausti	Saltman and Stevens
Linda Kruger	SE Region, Alaska State Parks/DNR
Mike McKinnon	SE Region, Tech. Services
Robert Himman	SE Regional Council
	SEACC
Robert W. Loescher	Sealaska Corporation
Michael K. Snowden	Service Transfer, Inc.
Glen Charles	Shaan-Seet, Inc.
James Senna	Shee Atika, Inc.
Dr. Ron Dick	Sheldon Jackson College

Name	Organization
Edgar Wayburn	Alaska Chapter, Sierra Club
Mark Cooper	Sierra Club
Mark Cooper	Siskiyou NF
Molene Capbell	Siskiyou NF
T. Smith	City and Borough of Sitka
Virgil Henke	Sitka Advisory Committee
Bruce Johnson	Sitka Chamber of Commerce
Environmental Coordinator	Sitka Advisory Committee
Don Soukup	Skagway Public Library
Kate Troll	Society of American Foresters
Adele Backeil	Soil Conservation Service
Joseph Sebastian	Don Soukup
Warren F. Powers	Southeast Seiners Assoc.
L.L. Schroeder	Southeastern Log
Adel Backeil	Spec CRS-ENR, LM-423
State-Fed. Coord./Project Alaska	State-Fed. Coord./Project Alaska
Stratton Library	Stratton Library
Sumner Strait Advisory Comm.	Sumner Strait Advisory Comm.
Sumner Strait Advisory Comm.	Sumner Strait Advisory Comm.
Supt. Hydaburg School	Supt. Hydaburg School
Don See	City of Tenakee Springs
Geron Bruce	Tenakee Springs Public Library
Steve Colt	Tenakee Advisory Committee
Marcus Horton	Thorne Bay Community Library
Michael Jacobson	Timber Faller, Inc
Wayne Oien	Tlingit-Haida Central Council
	U.S.A.G.
	University of Alaska, Anchorage Director. Envir
	US Dept. of Interior
	US Fish & Wildlife Service
	US Army Corps of Engineers

<b>Name</b>	<b>Organization</b>
Comm. Douglas Smith	US Coast Guard District 17
Representative Young	US House of Representatives
F. Dale Robertson, Chief	USDA, Forest Service, Washington, D.C.
Larry Ethelbath	USDI-BIA, Forestry/S.E. Agency
Dick Powers	Whalers Cove Lodge
Karen Jeffman	The Wilderness Society
John Schoen	The Wildlife Society
James E. Gove	City of Wrangell
Rush Duncan	City of Wrangell
Michael Lockabey	Wrangell Sentinel
Ronald M. Gelbrich	Wrangell Forest Products
Cheryl Esferwood	Wrangell Advisory Committee
Sandra L. Anderson	Wrangell Forest Products
Bruce Bachen	Yak-Tat Kwann, Inc.
Richard Baker	City of Yakutat Annette Anderson
Astrid Bethers	
Bruce Blake	
Arthur Bloom	
Floyd Branson	
Steve Brenner	
Royal Breseman	
Phil Briggs	
Gerald Brookman	
Jose Broto	
Mr. Everett Burns	
Edward Buyarski	
Richard Campbell	
Christopher Carroll	
Mona Christian	
Marlene Clarke	
Helen Clough	

Name	Organization
Dr. Henry Cole	
Gregory Cook	
Paul & Gail Corbin	
Chas. Dense	
Jim Digennaro	
David Duffey	
Helen M. Drury	
Thomas M. Franklin	
Barry Freedman	
Dr. Donald Freedman	
Peter Froehlich	
Wayne & Krist. Funk	
Joe Geldhof	
Virgil & Jean Gile	
Norma Goodman	
Richard Gordon	
Richard Hacker	
Kenneth Hammons	
Dave Hardy	
E.J. Haugen	
Jake Hess	
Amy & Charlie Hodgson	
Donn Hopkins	
Bob Howe	
Thomas E. Jacobsen, DDS	
Richard Jandreau	
Sid Jenson	
Gail Johansen	
Nora Ann Johnson	
Dorothy A. Jones	
Lois Jund	
Sally Kabisch	
Molly Kemp	
Chris Kent	
Robert Ketchum	

Name	Organization
Mark J. Kirchhoff	
K. & M. Leccese	
Max M. Lewis	
Cliff Lobaugh	
Enid & Fred Magill	
Craig Mapes	
Karin McCullough	
Mark Meeks	
Honorable Frank Murkowski	
Michael Nelson	
Richard K. Nelson	
Gloria Ohmer	
Edward Octken	
Gloria Ohmer	
Sig Olson	
Wayne Pattison	
Tom Paul	
Jacob W. Pratt, Jr.	
G. H. Reifenstein Jr	
Carl Reller	
Steve Rentenstihl	
Chuck Rice	
N.J. Richards	
Irene Roundtree	
Gail Sage	
Edward Sargent, MD	
Lee Schmidt	
John Schulz	
Carolyn Servid	
John Shelton	
Jeff Sloss	
Robert Smith	
Lin Sonnenberg	
Richard Sprague	
Honorable Ted Stevens	

Name	Organization
Bob Stredwick	
John Swanson	
Honorable Robin Taylor	
D. Thorington	
Richard Uberuaga	
Dave Waarvik	
Janet Wallin	
David E. Wallingruff	
Bella Watson	
S. M. Watson	
Susan Watson	
Hans F. Weinberg	
Ralph Wells	
Ron Welsh	
Bill Whitman	
William Williamson	
Syd Wright	
Henry Wojtusik	
Rollin Young	
Ron Zobel	

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# **Chapter 8**

## **Glossary**



# Chapter 8

## Glossary

### Acronyms used in text:

ACMP	Alaska Coastal Management Program
ADF&G	Alaska Department of Fish and Game
AHMU	Aquatic Habitat Management Unit
ALP	Alaska Lumber and Pulp Corporation
ANCSA	Alaska Native Claims Settlement Act
ANILCA	Alaska National Interest Lands Conservation Act
APC	Alaska Pulp Corporation
ASQ	Allowable Sale Quantity
BMP	Best Management Practices
CFL	Commercial Forest Land
CZMA	Coastal Zone Management Act
DEIS	Draft Environmental Impact Statement
EVC	Existing Visual Condition
FEIS	Final Environmental Impact Statement
IDT	Interdisciplinary Team
LOD	Large Organic Debris
LTF	Log Transfer Facility
LUD	Land Use Designation
MAI	Mean Annual Increment
MBF	One thousand board feet
MMBF	One million board feet
MELP	Multi-Entry Layout Process
NEPA	National Environmental Policy Act
NFMA	National Forest Management Act
NOI	Notice of Intent
NRHP	National Register of Historic Places
ROD	Record of Decision
ROS	Recreation Opportunity Spectrum
RPA	Forest and Rangeland Renewable Resources Planning Act
SEIS	Supplemental Environmental Impact Statement
SHPO	State Historic Preservation Officer
TLMP	Tongass Land Management Plan
TRUCS	Tongass Resource Use Cooperative Study
TTF	Terminal Transportation Facility (equivalent to LTF)
TTSF	Tongass Timber Supply Fund
VCU	Value Comparison Unit
VQO	Visual Quality Objective

## **Terms used in text:**

### ***Adjacent Harvest***

Used to indicate when activity is projected to occur near the upper banks of an active stream bank.

### ***Aerial Harvest Systems***

Harvesting methods in which the cut logs are moved from the stump to the loading area or log deck without touching the ground. Examples are helicopter and balloon logging.

### ***Age Class Diversity***

The amount of age class distribution within a stand. Stands with low age class diversity would be composed of trees of approximately the same age, while stands with high age class diversity would contain trees of many ages.

### ***Alaska Lumber and Pulp Corporation***

Now named Alaska Pulp Corporation (APC).

### ***Alaska National Interest Lands Conservation Act (ANILCA)***

Passed by Congress in 1980, this legislation designated 14 national forest wilderness areas in Southeast Alaska. In section 705(a) Congress directed that at least \$40,000,000 be made available annually to the Tongass Timber Supply Fund to maintain the timber supply from the Tongass National Forest at a rate of 4.5 billion board feet per decade. Section 810 requires evaluations of subsistence impacts before changing the use of these lands.

### ***Alaska Native Claims Settlement Act (ANCSA)***

Approved December 18, 1971, ANCSA provides for the settlement of certain land claims of Alaska natives and for other purposes.

### ***Alaska Pulp Corporation (APC)***

Previously Alaska Lumber and Pulp Corporation.

### ***Allocation***

Commitment of a parcel of land to one or more kinds of use. Constraints limit the uses of a given parcel to less than the full set of land management options. Land allocations are made in TLMP.

### ***Allowable Sale Quantity (ASQ)***

ASQ refers to the maximum quantity of timber that may be sold each decade from the Tongass National Forest. This quantity, expressed as a board foot measure, is calculated per timber utilization standards specified in the Alaska Regional Guide, the number and type of acres available for timber management, and the intensity of timber management. The ASQ was calculated at 4.5 billion board feet per decade for the Tongass National Forest.

### ***Alpine Zones***

The region found on a mountain peak above the tree line.

### ***Anadromous Fish***

Anadromous fish (such as salmon, steelhead, and shad) spend part of their lives in freshwater and part of their lives in saltwater.

### ***Analysis Area***

An analysis area is a planning unit made up of two or more management areas identified in the Tongass Land Management Plan. This grouping of management areas is consistent with the area analysis direction found in the 1985-86 Tongass Land Management Plan Amendment and with the scope of the Supplement project.

### ***APC Contract Area***

Those portions of Baranof, Chichagof, and Kuiu Islands shown on Figures 1-2 and 1-3 in the Final SEIS.

### ***Appraisal***

See Timber Appraisal.

### ***Aquatic Habitat Management Unit (AHMU)***

A mapping unit that displays an identified value for aquatic resources. It is a mechanism for carrying out aquatic resource management policy.

*Class I AHMU:* Streams with anadromous or high quality sport fish habitat. Also included is the habitat upstream from a migration barrier known to have reasonable enhancement opportunities for anadromous fish.

*Class II AHMU:* Streams with resident fish populations and generally steep (6 to 15 percent) gradient (can also include streams from 0 to 6 percent gradient where no anadromous fish occur). These populations have limited sport fisheries values and are separate from the high quality sport fishing systems included in Class I. They generally occur upstream of migration barriers or are steep gradient streams with other habitat features that preclude anadromous fish use.

*Class III AHMU:* Streams with no fish populations but have potential water quality influence on the downstream aquatic habitat.

### ***Beach Fringe Habitat***

Forested habitat that occurs from the intertidal zone inland 600 feet, and islands of less than 50 acres. Beach fringe habitat is an emphasis habitat.

### ***Benthic Habitat***

Refers to the substrate and organisms on the bottom of marine environments.

### ***Best Management Practice***

A practice or combination of practices that, after problem assessment, examination of alternative practices, and appropriate public participation, is determined by a state to be the most effective and practicable means of preventing or reducing the amount of pollution generated by nonpoint sources to a level compatible with water quality goals. A BMP is not a site-specific prescription, but an action -initiating mechanism which eventually leads to the interdisciplinary development of a site-specific prescription.

### ***Broadcast Burning***

Burning of an area that has been clearcut to remove logging slash from the site. Broadcast burning is done to prepare sites for regeneration or improve wildlife habitat.

### ***Cant***

A log partly or wholly cut and destined for further processing.

### ***Capability***

An evaluation of a resource's inherent potential for use.

### ***Carryover***

Timber volume designated for harvest in a five-year Operating Period, but not harvested during that period. It is, therefore, available for subsequent five-year Operating Periods.

### ***Clearcut***

A method of regeneration cutting in which the old crop is completely cut in designated patches. Regeneration in the Alaska Region is usually natural; and the size of the clearcut area rarely exceeds 100 acres.

### ***Climax Forest***

A forest in which the species composition and condition of the stand is stable. This is the last stage of succession and does not change if the environment remains unchanged.

### ***Commercial Fishery***

Fish, shellfish, or other fishery resources taken or possessed within a designated area for commercial purposes.

### ***Commercial Forest Land (CFL)***

Productive forest land that is producing or capable of producing crops of industrial wood and is not withdrawn from timber utilization by statute or administrative regulation. This includes areas suitable for management and generally capable of producing in excess of 20 cubic feet per acre of annual growth or in excess of 8,000 board feet net volume per acre. It includes accessible and inaccessible areas.

*Normal CFL:* Timber that can be economically harvested with locally available logging systems. Composed of two categories:

*Standard:* Timber that can be economically harvested with locally available logging systems, such as highlead or short-span skyline.

*Special:* Timber that is in areas where special consideration is needed to protect other resources but can be harvested with locally available logging systems.

*Nonstandard CFL:* Timber that cannot be harvested with locally available logging systems and would require the use of other logging systems, such as helicopter or long-span skyline.

### ***Conveyance***

The passing of the title of a property from one owner to another.

### ***Cruise***

Refers to the general activity, as opposed to a specific method, of determining timber volumes and quality.

### ***Cultural Resources***

Historic or prehistoric objects, sites, buildings, structures, and so on that result from past human activities.

### ***Cumulative Effects***

Cumulative effects are the impacts on the environment resulting from the addition of the incremental impacts of past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions. Cumulative impacts can result from individually minor, but collectively significant, actions occurring over time.

### ***Cutover***

Areas harvested recently.

### ***Deer Winter Range***

A combination of environmental elements that support Sitka black-tailed deer under moderately severe or severe winter conditions. Deer winter range is an emphasis habitat.

### ***Deferred VCUs***

A deferred VCU is one in which further road construction and/or timber harvest would be deferred until the Supplement document is completed as required by the Court. The Notice of Intent lists all deferred VCUs.

### ***Direct Employment***

The jobs that are immediately associated with the Long-Term Contract timber sale, including, for example, logging, sawmills, and pulpmills.

### ***Dispersed Recreation***

Recreational activities that are not confined to a specific place.

### ***Draft Environmental Impact Statement***

Section 102 of the National Environmental Policy Act (NEPA) requires that a statement of environmental effects for a major Federal action be released to the public and other agencies for comment and review prior to a final management decision.

### ***Eagle Nest Tree Buffer Zone***

A 330-foot radius around eagle nest trees established in a Memorandum of Understanding between the US Fish and Wildlife Service and the Forest Service.

### ***Emphasis Habitats***

Wildlife habitats identified in the 1986-90 EIS to address wildlife issues relating to timber harvest activities. Those habitats include: deer winter range, inland wetland, beach fringe, estuarine fringe, and streamside riparian.

### ***Emphasis Species***

The following categories were used where appropriate: endangered and threatened plant and animal species identified on State and Federal lists; species with special habitat needs that may be influenced significantly by planned management programs; species commonly hunted, fished, or trapped; nongame species of special interest; additional plant or animals selected because their population changes are believed to indicate effects of management activities on other species of a major biological community or on water quality.

### ***Entry***

Harvest of a specific portion of the total rotational volume.

### ***Estuarine Fringe Habitat***

A 1,000-foot timbered zone around an estuary. Estuarine fringe is an emphasis habitat.

### ***Estuary***

For the purpose of this EIS process, estuary refers to the relatively flat, intertidal, and upland areas generally found at the heads of bays and mouths of streams. They are predominantly mud and grass flats and are unforested except for scattered spruce or cottonwood.

### ***Evaluation Criteria***

Predetermined criteria for evaluating alternatives or options.

### ***Existing Visual Condition (EVC)***

The level of visual quality or condition presently occurring on the ground. The six existing visual condition categories are:

**Type I:** These areas appear to be untouched by human activities.

**Type II:** Areas in which changes in the landscape are not noticed by the average person unless pointed out.

**Type III:** Areas in which changes in the landscape are noticed by the average person, but they do not attract attention. The natural appearance of the landscape still remains dominant.

**Type IV:** Areas in which changes in the landscape are easily noticed by the average person and may attract some attention. Although the change in landscape is noticeable, it may resemble a natural disturbance.

**Type V:** Areas in which changes in the landscape are obvious to the average person. These changes appear to be major disturbances.

**Type VI:** Areas in which changes in the landscape are in glaring contrast to the natural landscape. The changes appear to be a drastic disturbance.

### ***Feasibility***

The opportunity for cost-effective harvest and transportation of timber.

### ***Fish Habitat***

The aquatic environment and the immediately surrounding terrestrial environment that, combined, afford the necessary physical and biological support systems required by fish species during various life stages.

### ***Floodplain***

The lowland and relatively flat areas joining inland and coastal waters, including debris cones and flood-prone areas of offshore islands; including, at a minimum, that area subject to a 1 percent (100-year recurrence) or greater chance of flooding in any given year.

### ***Forest and Rangeland Renewable Resources Planning Act of 1974. (RPA)***

Amended in 1976 by the National Forest Management Act.

### ***Forested Habitat***

All areas with forest cover. Used in this final EIS to represent a general habitat zone.

### ***Grabinski***

A modified highlead cable logging system.

### ***Habitat Capability***

The number of healthy animals that a habitat can sustain. In the Supplement, this term refers to Sitka black-tailed deer and pine marten in all Analysis Areas, and to Sitka black-tailed deer, pine marten, and brown bear in Analysis Areas 2, 3, and 6.

### ***Habitat Improvement***

Management of wildlife and fish habitats to increase their capability.

### ***Highlead Cable Logging***

A method of transporting logs to a collecting point by using a power cable passing through a block fastened off the ground to lift the front ends of the logs clear off the ground while in transit.

### ***Important Subsistence Use Area***

Important Subsistence Use Areas include the “most reliable” and “most often hunted” categories from the TRUCS survey and from subsistence survey data from ADF&G, the University of Alaska, and the Forest Service, Region 10. Important use areas include both intensive and extensive use areas for subsistence harvest of deer, furbearers, and salmon.

### ***Indirect Employment***

The jobs in service industries that are associated with the Long-Term Contract timber sale including, for example, suppliers of logging and milling equipment.

### ***Induced Employment***

The jobs in the service or governmental sectors that result from increased population or purchases associated with the Long-Term Contract timber sale; includes, for example, restaurant employment.

### ***Inland Wetland Habitat***

Lakes, beaver ponds, marsh lands, and associated grass/sedge meadows greater than 10 acres, plus a 500-foot buffer.

### ***Inoperable Timber***

Timber that cannot be harvested by any proven method because of potential resource damage, extremely adverse economic considerations, or physical limitations.

### ***Interdisciplinary Team (IDT)***

A group of people with different backgrounds assembled to solve a problem or perform a task.

### ***Land Use Designation (LUD)***

The method of classifying land uses presented in the Tongass Land Management Plan (TLMP). Land uses and activities are grouped to define, along with a set of coordinating policies, a compatible combination of management activities. The following is a description of the four classifications:

*LUD I:* Wilderness areas.

*LUD II:* These lands are to be managed in a roadless state in order to retain their wildland character, but this designation would permit wildlife and fish habitat improvement, as well as primitive recreation facility and road development under special authorization.

*LUD III:* These lands may be managed for a variety of uses. The emphasis is on managing for uses and activities in a compatible and complimentary manner to provide the greatest combination of benefits.

*LUD IV:* These lands provide opportunities for intensive resource use and development, where the emphasis is primarily on commodity or market resources.

### ***Large Organic Debris (LOD)***

Any large piece of relatively stable woody material having a least diameter of greater than 10 centimeters and a length greater than one meter that intrudes into the stream channel.

### ***Layout***

Planning and mapping (using aerial photos) of harvest and road systems needed for total harvest of a given area.

### ***Log Transfer Facility (LTF)***

A facility that is used for transferring commercially harvested logs to and from a vessel or log raft, or the formation of a log raft. It is wholly or partially constructed in waters of the United States and siting and construction are regulated by the 1987 Amendments to the Clean Water Act. Formerly termed terminal transfer facility.

### ***Logging Camp***

A temporary facility established to house industry and Forest Service personnel while timber harvest occurs in the area.

### ***Logistical Constraints***

The short time frame during which the SEIS alternatives could be implemented (before December 31, 1990) causes limitations on the accessibility of harvest areas. The length of time required to acquire permits to construct a log transfer facility, the time required to construct a road, or the time needed to harvest the timber may not fit within the SEIS time frame.

### ***Management Area***

An area one or more VCUs in size for which management direction was written in the Tongass Land Management Plan. All or portions of 13 Management Areas are included in the 1986-90 Study Area.

### ***Marginal***

Commercial forest land areas that do not qualify as standard or special CFL since they are not operable under short-term (ten years or less) projections of accessibility and economic conditions.

### ***Mass Failure***

The downslope movement of a block or mass of soil. This usually occurs under conditions of high soil moisture, and does not include individual soil particles displaced as surface erosion.

### ***Mean Annual Increment***

The total volume of a tree or stand divided by the stand age. The volume may be expressed in cubic feet or board feet per year.

### ***Memorandum and Order***

Refers to the Memorandum and Order in the case of *Tenakee Springs v. Courtright*, No. J86-024 Civil (D. Alaska) Game Creek signed June 24, 1987 and the Memorandum and Order on Port Camden Road/East Kuiu Management Area in the case of *Tenakee Springs v. Courtright*, No. J86-024 Civil (D. Alaska) Threemile Arm, signed July 31, 1987. Both Memoranda and Orders were signed by James A. von der Heydt, United States District Court Judge for the State of Alaska. Also refers to the Memorandum and Order in the case of *Hanlon v. Barton*, No. J88-025 (District of Alaska) signed November 14, 1988 by J. A. von der Heydt.

### ***Mitigation***

These measures include avoiding an impact by not taking a certain action or part of an action; minimizing an impact by limiting the degree or magnitude of an action and its implementation; rectifying the impact by repairing, rehabilitating, or restoring the affected environment; reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; or compensating for the impact by replacing or providing substitute resources or environments.

### ***Multi-Entry Layout Process***

Computerized database located in each area supervisor's office containing information on timber and transportation and TLMP management goals. It is used for planning and economic analyses for the Forest Service administrative area.

### ***National Environmental Policy Act (NEPA)***

Passed by Congress in 1969, NEPA declared a national policy to encourage productive harmony between humans and their environment, to promote efforts that will prevent or eliminate damage to the environment and the biosphere and stimulate the health and welfare of humans, to enrich the understanding of the ecological systems and natural resources important to the nation, and to establish a Council on Environmental Quality. This act requires the preparation of environmental impact statements for federal actions that are determined to be of major significance.

### ***National Forest Management Act (NFMA)***

A law passed in 1976 that amends the Forest and Rangeland Renewable Resources Planning Act and requires the preparation of Forest plans.

### ***National Register of Historic Places (NRHP)***

Official catalogue of cultural resources that are significant in American history, prehistory, architecture, engineering, and culture; maintained by the U.S. Department of the Interior.

### ***Native Allotment***

A tract of non-mineral land, not to exceed 160 acres, on which an Alaskan Native (who was 21 years of age or head of a household) established continuous use and occupancy prior to the creation of the National Forests (authorized under the Native Allotment Act of May 17, 1906).

### ***Native Selection***

A tract of land on which an Alaska Native, Native group, Village Corporation, or Regional Corporation has made application for ownership as authorized under Sections 12, 14, and 16 of Alaska Native Claims Settlement Act (ANCSA) and as amended by Titles IX and XIV of Alaska National Interest Lands Conservation Act (ANILCA).

### ***Noncommercial Forest Land***

Land with more than 10 percent cover of commercial tree species, but not qualifying as commercial forest land.

### ***Nondeferred VCUs***

Interim operating areas where scheduled timber harvesting and road construction may take place without further NEPA analysis, as directed by a court-approved settlement and the Notice of Intent.

### ***Nonforest Land***

Land that has never supported forests and lands formerly forested but now developed for nonforest uses or land with less than 10 percent cover of commercial tree species.

### ***Nonstandard Harvest Operability***

Timber that cannot be harvested with standard equipment and techniques but that would require other systems including balloon, helicopter, or skyline over 2,600 feet, as defined in the TLMP.

### ***Nonstandard Logging Systems***

These systems are not in predominant use on the Tongass National Forest. Nonstandard systems include multi-span skyline, long single span skylines (skylines with a reach over 2600 feet), and helicopters.

### ***Normal Harvest Operability***

Timber that can be harvested with currently employed standard equipment and predominant techniques such as highlead, A-frame, skyline of less than 2600 feet, and tractor. This is defined as TLMP Operability Class 1.

### ***Notice of Intent (NOI)***

Notice of Intent was submitted to indicate an intention to produce an EIS Supplement to the 1981-86 and 1986-90 Operating Plan Environmental Impact Statements for the Alaska Pulp Corporation. The NOI was signed on September 30, 1987.

### ***Old-Growth Forest***

Old-growth stands are characterized by trees well past the age of maturity (dominant trees exceed 300 years in age). Stands exhibit declining growth rates and signs of decadence, such as dead and dying trees, snags, and downed woody material. Stands include trees of all ages, multilayered canopies, a range of tree diameter sizes (including very large diameter trees, up to and exceeding 3 meters), and the notable presence of understory vegetation. Old growth stands are defined in the TLMP inventory as those stands having the majority of timber volume in trees more than 150 years of age.

### ***Old-Growth Habitat***

Lands identified during the 1986-90 plan process and prescribed for continued management to maintain old-growth forest characteristics through the planning period, subject to further planning and NEPA disclosure.

### ***Operability***

Timber suitable for harvest and transport to a market. See inoperable, nonstandard, and normal harvest operability.

### ***Overstory***

In a stand with several vegetative layers, the overstory is the uppermost layer, usually formed by the tallest trees.

### ***Planning Record***

This is a detailed, formal account of the planning process for the Supplemental EISs. The record contains many forms of data, maps, reports, planning process information, and results of public participation in the planning process. The record provides the basis for the development of the environmental impact statement. For this supplement, the planning record is collectively located at Tongass National Forest field offices in Petersburg, Sitka, and Hoonah, as well as the regional office in Juneau, Alaska.

### ***Potential Yield***

The potential yield for the next ten years is the maximum harvest that is possible given the optimum perpetual sustained-yield harvesting level attainable with intensive forestry on regulated areas and considering productivity of the land, conventional logging technology, standard silvicultural treatments, and relationships with other resource uses and the environment.

### ***Precommercial Thinning***

The practice of removing some of the trees of less than marketable size from a stand in order to achieve various management objectives.

### ***Prescriptions***

A set of treatments or practices designed to develop and/or protect some combination of resources.

### ***Recreation Opportunity Spectrum (ROS)***

The framework for planning and managing the recreation resource that consists of six classes from primitive to urban. Each ROS class is defined in terms of its setting and the recreational experiences offered in that setting. Other factors, including the extent to which the natural environment has been modified, the type of facilities developed, and the degree of outdoor skills needed to enjoy the area also play a role in defining the ROS class.

*Primitive I:* Includes areas out of sight and sound of human activities and greater than 3 miles from roads open to public travel and marine travelways. Provides opportunities for a high degree of interaction with the natural environment, challenge, risk, and the use of outdoor skills.

*Primitive II:* Area is similar in appearance to Primitive I ROS class; however, is accessible by marine travelway or is within 1/4 mile of low use trails.

*Semi-Primitive Nonmotorized:* Includes areas greater than 1/4 mile and less than 3 miles from all roads, trails, or readily accessible marine travelways. Provides limited opportunities for isolation from the sights and sounds of humans and a high degree of interaction with the natural environment. Moderate challenge, risk, and the opportunity to use outdoor skills.

*Semi-Primitive Motorized:* Includes areas less than 1/4 mile from primitive roads, trails or readily accessible marine travelways. Characterized by a predominantly unmodified natural environment with minimum evidence of sights and sounds of humans. Road access is not maintained in these areas.

*Roaded Natural:* Areas are less than 1/4 mile from roads open to public travel, major power lines, and areas of timber harvest. Areas are characterized by predominantly natural environments with moderate evidence of sights and sounds of humans.

*Roaded Modified:* Areas are less than 1/4 mile from areas of timber harvest and transportation corridors. Areas are characterized by modified natural environment where utilization practices are common and are for purposes other than recreation.

*Rural:* Includes those areas with small communities, developed campgrounds, and administrative sites. These areas are characterized by substantially modified natural environments. Sights and sounds of humans are readily evident.

*Urban:* Areas characterized by substantially urbanized environment. The background may have elements of a natural environment. Timber harvest activities and utilization practices are common. Sights and sounds of humans predominant. Large numbers of visitors can be expected on site and in nearby areas.

### ***Resident Fish***

Fish that are not anadromous and that reside in fresh water on a permanent basis. Resident fish include non-anadromous dolly varden char and cutthroat trout.

### ***Retention Factor***

The amount of commercial forest land removed from the calculation of the ASQ as an allowance to protect other resource values. These factors are allowances available to draw upon when meeting other resource needs and are not fixed policies to be rigidly applied by the Interdisciplinary Team or Forest Supervisors.

### ***Right-of-Way***

The privilege that a person or persons may have of passing over another's land.

### ***Riparian***

Areas immediately adjacent to a body of water, the vegetation of which is usually influenced by the water.

***Roads, Collector***

This functional class of road serves moderate-sized areas and usually connects to a forest arterial or public highway. It collects traffic from forest local roads.

***Roads, Local***

This functional class of road provides access for a specific resource use activity, such as a timber sale or recreation site, although other minor uses may be served.

***Roads, Preplanned***

Roads planned in a prior EIS.

***Roads, Specified***

A road, including related transportation facilities and appurtenances, shown on the Sale Area Map and listed in the Timber Sale Contract.

***Roads, Temporary***

For National Forest timber sales, temporary roads are constructed to harvest timber on a one-time basis. These logging roads are not considered part of the permanent forest transportation network, and have stream crossing structures removed, erosion measures put into place, and the road closed to vehicular traffic after harvest is completed.

***ROD Postponed***

Timber harvest and/or road construction in VCUs that were postponed by the 1986-90 Record of Decision.

***Rotation***

The planned number of years (approximately 100 years in Alaska) between the time that a forest stand is regenerated and its next cutting at a specified stage of maturity.

***RPA***

Forest and Rangeland Renewable Resources Planning Act of 1974.

***Salvage Cutting***

Cutting primarily to utilize dead/down material resulting from windthrow and scattered poor risk trees that will not be marketable if left in the stand until the next scheduled harvest. Salvage sales must contain more than 50 percent by volume of dead, insect infested, or windthrown timber.

***Salvage Sale***

A timber sale to use dead and down timber and scattered poor-risk trees that would not be marketable if left in the stand until the next scheduled harvest.

***Sawlog***

A log considered suitable in size and quality for producing sawn lumber.

***Second-Growth Forest***

Even-aged stands that will grow back on a site after removal of the previous timber stand.

***Selective Cutting***

A harvest method in which only some of the trees are removed from the area at one time.

### ***Sensitivity Level***

The measure of people's concern for the scenic quality of the National Forests. In 1980, the Tongass National Forest assigned sensitivity levels to land areas viewed from boat routes and anchorages, plane routes, roads, trails, public use areas, and recreation cabins.

*Level 1:* Includes all seen areas from primary travel routes, use areas, and water bodies where at least three-fourths of the forest visitors have a major concern for scenic quality.

*Level 2:* Includes all seen areas from primary travel routes, use areas, and water bodies where at least one-fourth of the forest visitors have a major concern for scenic quality.

*Level 3:* Includes all seen areas from secondary travel routes, use areas, and water bodies where less than one-fourth of the forest visitors have a major concern for scenic quality.

### ***Shelterwood Cutting***

A harvest method in which most of the trees are removed in an initial entry, and some trees are left to naturally reseed the area and provide protection to new seedlings that establish on the site. A second entry is conducted later to remove the remaining trees.

### ***Silviculture***

Forest management practices that deal with the establishment, development, reproduction, and care of forest trees.

### ***Slash***

Debris left over after a logging operation, i.e., limbs, bark, broken pieces of logs.

### ***Soil Hazard Areas***

Mapped areas within which various soil hazards may be encountered. Hazards include mass failures and high sediment production during road construction.

### ***Spawning Area***

The available area in a stream course that is suitable for the deposition and incubation of salmon or trout eggs.

### ***Species Diversity***

The number of different species occurring in a location or under similar environmental conditions.

### ***Standard Logging Systems***

Referred to as normal logging systems in the Timber and Silviculture Resource Report. These systems include highlead, A-frame, single span skyline (skyline with a reach less than 2,600 feet), and tractor.

### ***State Historic Preservation Officer (SHPO)***

State appointed official who administers Federal and State programs for cultural resources.

### ***Streamside Riparian***

Forested areas within 500 feet of anadromous spawning areas.

### ***Study Area***

That portion of the sale area that was being studied for 1981-86 and 1986-90 Operating Periods.

### ***Stumpage***

The value of timber as it stands uncut in terms of dollar value per thousand board feet.

### ***Subsistence Use***

The term “subsistence use” means the customary and traditional uses by rural Alaskan residents of wild renewable resources for direct, personal, or family consumption as food, shelter, fuel, clothing, tools, or transportation; for the making and selling of handicraft articles out of nonedible byproducts of fish and wildlife resources taken for personal or family consumption; for barter, or sharing for personal or family consumption; and for customary trade.

### ***Successional Stage***

One stage in a series of changes affecting the development of a biotic community. On its path to a climax stage the community will pass through several stages of adaptation to environmental changes.

### ***Suitability***

An evaluation of a resource’s potential for proposed management activities.

### ***Thousand Board Foot Measure***

A method of timber measurement in which the unit is equivalent to 1,000 square feet of lumber one inch thick. It can be abbreviated Mbd, Mbm, or MBF.

### ***Timber Appraisal***

Establishing the fair market value of timber by taking the selling value minus manufacturing costs, the cost of getting logs from the stump to the manufacturer, and an allowance for profit and risk.

### ***Timber Sale Contract***

Refers to the APC Long-Term Timber Sale Contract in the Supplemental EIS. The Timber Sale Contract is between the Alaska Pulp Corporation and the Forest Service, and is informally referred to by many as the 50-year Contract.

### ***Tongass Land Management Plan (TLMP)***

The 10-year land allocation plan for the Tongass National Forest that directs and coordinates planning and the daily uses and activities carried out within the forest. See also Land Use Designation.

### ***Tongass Resource Use Cooperative Study (TRUCS)***

A compilation of data on subsistence uses for evaluating the effects of the Forest Service’s action contemplated in the revision of the regional Tongass Land Management Plan.

### ***Tongass Timber Supply Fund (TTSF)***

Money established by Congress in ANILCA to make available for harvest 4.5 billion board feet from the Tongass National Forest per decade. The money is used to provide access to marginal timber stands and to allow for protection of other resource values.

### ***Utility Logs***

Those logs that do not meet sawlog grade, but are suitable for production of firm useable pulp chips.

### ***Value Comparison Unit (VCU)***

These areas, which generally encompass a drainage basin, were established in the Tongass National Forest to provide a common set of areas where resource inventories could be conducted and resource interpretations made.

### ***Visual Quality Objectives (VQOs)***

Measurable standards reflecting five different degrees of landscape alteration based upon a landscape's diversity of natural features and the public's concern for high scenic quality. The five categories of VQOs are:

*Preservation:* Permits ecological changes only. Applies to wilderness areas and other special classified areas.

*Retention:* Provides for management activities that are not visually evident; requires reduction of contrast through mitigation measures either during or immediately after operation.

*Partial Retention:* Management activities remain visually subordinate to the natural landscape. Mitigation measures should be accomplished within one year of project completion.

*Modification:* Management activities may visually dominate the characteristics landscape. However, activities must borrow from naturally established form, line, color, and texture so that its visual characteristics resemble natural occurrences within the surrounding area when viewed in the middleground distance.

*Maximum Modification:* Management activities may dominate the landscape. Mitigation measures should be accomplished with five years of project completion.

### ***Volume***

Stand volume based on standing net board feet per acre by Scribner Rule.

### ***Volume Class***

Volume classes are used to describe the average volume of timber per acre in thousands of board feet (MBF). Following are the seven volume classes and the range of volume each contains.

*Volume Classes 1 to 3:* Less than 8 MBF/acre (cleared land, seedlings, or pole timber stands).

*Volume Class 4:* 8 to 20 MBF/acre.

*Volume Class 5:* 20 to 30 MBF/acre.

*Volume Class 6:* 30 to 50 MBF/acre.

*Volume Class 7:* 50+ MBF/acre.

### ***V-notch***

A V-shaped stream channel generally on steep, mountainous terrain.

### ***Watershed***

The drainage area of a stream.

### ***Wetland***

Those areas that are inundated by surface or ground water frequently enough to support vegetation that requires saturated or seasonally saturated soil conditions for growth and reproduction.

### ***Wilderness***

An area established by the Federal Government and administered either by the Forest Service, National Park Service, Fish and Wildlife Service, or Bureau of Land Management in order to conserve its primeval character and influence for public enjoyment, under primitive conditions, in perpetuity.

***Wildlife Habitat***

The locality where a species may be found and where the essentials for its development and sustained existence are obtained.

***Wildlife Habitat Management Unit (WHMU)***

An area of wildlife habitat identified during the IDT process as having values important to wildlife.

***Windthrows***

Areas where trees are uprooted by the wind.

# **Chapter 9**

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# Chapter 9

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Sitka Black-tailed Deer . . . . .	1-10, 3-20 through 3, 3-29, 3-30, 3-35, 3-38 through 31, 3-40, 3-43, -87, 3-96, 3-97, 3-99, 3-100, 3-102 through 107, 3-111, 3-113 through 116, 4-28, 4-32, 4-39
Soils . . . . .	3-1 through 10, 3-12, 3-14, 3-17, 3-56, 3-97, 4-1, 4-2, 4-14, 4-15, 4-62, 4-100, 4-135
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Subsistence . . . . .	1-10, 1-12, 1-16 through 18, 2-2, 2-38, 2-39, 2-43, through 45, 3-1, 3-20, 3-30, 3-33, 3-35, 3-38, 3-44, 3-52, 3-77, 3-83, 3-92 through 94, 3-96, 3-97, 3-99, 3-100, 3-102 through 110, 3-113, 3-115, 3-116, 4-110 through 133
Tenakee . . . . .	1-3, 1-8, 1-10, 1-12, 1-15 through 17, 2-3, 2-11, 2-35, 2-36, 2-38, 2-42, 3-1, 3-8, 3-9, 3-16, 3-18, 3-21, 3-35, 3-39, 3-43, 3-44, 3-49, 3-59, 3-61, 3-69, 3-70, 3-80, 3-92, 3-94, 3-97, 3-110, 3-111, 3-113 through 116, 4-111 through 113
<i>Tenakee Springs v. Courtright</i> . . . . .	1-8, 1-10, 1-11, 1-15 through 17, 2-3, 2-29, 2-104, 2-108, 2-109, 3-16, 3-92, 4-70, 4-110
Timber . . . . .	1-1, 1-3, 1-8 through 20, 2-1, 2-3, 2-4, 2-11, 2-15, 2-22, 2-25, 2-31, 2-32 through 35, 2-37, 2-39, 2-40, 2-42, 2-43, 2-44, 3-1, 3-2, 3-8 through 12, 3-14, 3-16, 3-18, 3-19, 3-21, 3-22, 3-30, 3-31, 3-35, 3-38, 3-39, 3-41, 3-43, 3-47, 3-49, 3-53, 3-54, 3-56, 3-57, 3-59, 3-60, 3-61, 3-63, 3-70, 3-71, 3-76, 3-77, 3-80, 3-81, 3-93, 3-100, 3-103 through 106, 3-108, 4-3, 4-14 through 16, 4-24, 4-32, 4-46, 4-49, 4-55 through 58, 4-59, 4-61 through 67, 4-71, 4-108, 4-109
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# **Appendices**



# **Appendix A-1**

## **Unit Cards**



**HARVEST UNIT MITIGATION/ENHANCEMENT METHODS  
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ANALYSIS AREA 3**

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<u>VCU</u>	<u>Unit #</u>	<u>Recreation</u>	<u>Visual</u>	<u>Wildlife</u>	<u>Soil</u>
203	127	A,G,H,J	A,H,K	A,H,I,J,L	D,I,Q
	128	A,B,C,E,G,H,J	A,B,C,D,F,H,K,M	A,H,I,J,L	D,L,L1,L4,R
	129	A,B,C,G,H	A,B,C,H,K	A,H,I,J,L	D,E,F,I,L,L1,L2,N
	130	G,H	H,K,N	A,H,I,J,L	D,J,Q
	132	G,H	H,K	A,H,I,J,L	D,Q
	131	A,G,H	A,H,K,N	A,H,I,J,L	D,E,L,L4,Q
	126	A,G,H,J	A,H,K	A,H,I,J,L	D,L,L4,Q
204	89	G,H,J	H,K	A,H,I,J,L	
	86	G,H	H,K	H,I,J,L	C,I
	88	G,H,J	H,K	A,H,I,J,L	
	90	G,H,J	H,K	A,H,I,J,L	
	91	G,H,J		A,H,I,J,L	
	93	G,H,J	H,K	C,H,I,J,K	
	92	G,H,J	H,K	A,H,I,J,L	
	99	G,H,J,L	H,K	C,H,I,J,K	
	121	G,H	H,K	C,H,I,J,K	
	122	G,H,J	H,K	C,H,J,K	
	123	G,H,J	H,K	C,H,J,K	
	124	A,B,C,G,H	A,B,C,H,K	A,H,I,J,L,O	
	95	G,H,J	H,K	A,H,I,J,L	C,E,H
	125	G,H,J	H,K	A,H,I,J,L	
	133	G,H,J,L	H,K	A,H,I,J,L	
	134	G,H,J,L	H,K	A,H,I,J,L	
	135	G,H,J,L	H,K	A,H,I,J,L	
	157	G,H,J	H,K	C,H,J,K	
	197	A,B,G,H,J,L	A,B,H,K	C,G,J,K	
	198	A,B,G,H,J	B,H,K	C,H,J,K	
	137	G,H,J	H,K	A,H,I,J,L	
	138	G,H,J	H,K	A,H,I,J,L	
	139	G,H,J	H,K	A,H,I,J,L	
	140	G,H,J	H,K	C,H,I,J,K	
	141	B,C,G,H,J,L	B,C,H,K	C,H,I,J,K	
	142	B,G,H,J,L	B,H,K	C,H,I,J,K	D,H,N
	143	E,H,J,L	F,K	A,H,I,J,L	
208	98	C,G,H	C,H,K,	A,H,I,J,L(2)	C,E,R
	97	B,G,H	A,B,H,J,K	A,H,I,J,L	D,J,K,M
	96	B,C,G,H	B,C,H,J,K	A,H,I,J,L	C,E,R
	94	G,H,J	H,K	A,H,I,J,L	C,I
	3	B,C,G,H	B,C,H,K,M	A,G,I,J,L	
	4	B,C,E,G,H,J	B,C,D,F,H,K,M	A,G,I,J,L	
	4	A,B,C,E,G,H,J	A,B,C,E,F,H,K,M	A,G,I,J,L	

**HARVEST UNIT MITIGATION/ENHANCEMENT METHODS  
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<u>VCU</u>	<u>Unit #</u>	<u>Recreation</u>	<u>Visual</u>	<u>Wildlife</u>	<u>Soil</u>
209	21	A,B,C,E,G,H,I,L	A,B,C,D,F,H,I,J K,M	B,H,J,K,N	
	22	A,B,C,E,G,H,I G,H,L	A,B,C,D,F,H,J	B,C,E,G,J,K,N,O	
17H					
17SEIS	G,H,L		H,K	A,G,I,J,L	D,E,L,L1,L2,L4
	11	A,B,C,E,G,H,I	A,B,C,D,F,H,K,M	B,H,J,K,O	
	13	A,B,C,E,G,H	A,B,C,D,F,H,K,M	C,G,J,K	
	14	A,B,C,G,H	A,B,C,H,K,M	A,C,G,I,J,L	
	16	G,H	H,K	A,G,I,J,L	D,E,F,L,L1,L2
210	16	A,B,C,E,F,G,H I,J	A,B,C,D,F,H,I K,L,M,N	B,E,F,G,H,J,K,N O,P	
	18	A,B,C,E,F,G,H I,J	A,B,C,D,F,G,H, I,K,M	B,E,F,G,H,J,K,N O,P	
	17	A,B,C,E,F,G,H I,J	A,B,C,D,F,G,H I,K,M	B,E,F,G,H,J,K,N O,P	
	15	B,G,H,I,J,L	A,B,H,K	A,H,I,J,L	
	12	A,B,C,E,F,H,I,J	A,B,C,D,F,G,J,K,M	E,H,J,K,M,O	
	13	A,B,E,F,G,H,I,J	A,B,C,D,F,G,H,I,J K,M	B,E,H,J,K,N,O	
	156	G,H,I	H,K	A,H,I,J,L	D,G,L,L5
	151	A,B,C,E,F,G,H,I J	A,B,C,D,F,G,H,I,J K,L,M,N	B,D,E,H,J,K,N,O	
	50	C,G,H,I	C,H,K	A,H,I,J,L	
	9	B,G,H,I,J	A,B,C,D,H,K	B,E,H,J,K,N,O	
	6	I	H,K	A,H,I,J,L	D,G,L,L1,L4,Q
	8	B,C,G,H,I	B,C,H,K	A,H,I,J,L	D,G,L,L1,L5
	7	B,G,H,I	B,H,K	A,H,I,J,L	D,G,L5,Q
	10	B,G,H,I	B,D,H,K	A,H,I,J,L	
	14	B,G,H,I,J,L	B,D,H,K,M	A,H,I,J,L	
	2	B,G,H,I	B,H,K	A,H,I,J,L	
	3	B,G,H,I	A,B,H,K	A,H,I,J,L	
	1	G,H,I	H,K	A,G,H,I,J,L	
211	1	A,B,C,E,F,G,H,I	A,B,C,D,F,G,H,I J,K,M	A,H,I,J,L	
	2	A,B,C,E,F,G,H,I	A,B,C,D,F,G,H,I J,K,M	A,H,I,J,L	
	4	A,B,C,E,F,G,H, I,J	A,B,C,D,F,G,H I,J,K,L,M	A,H,I,J,L	
	5	A,B,C,E,F,G,H I,J	A,B,C,D,F,G,H I,J,K,L,M	A,H,I,J,L	D,H,I,Q
	150	A,B,C,E,F,G,H I,J	A,B,C,D,F,G,H I,J,K,L,M,N	B,E,F,G,H,J K,N,O,P	H,L,L5,Q

**HARVEST UNIT MITIGATION/ENHANCEMENT METHODS  
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<u>VCU</u>	<u>Unit #</u>	<u>Recreation</u>	<u>Visual</u>	<u>Wildlife</u>	<u>Soil</u>
212	27	G,H,I	H,K	A,H,I,J,L	
	34	G,H,I,K	H,K	C,H,I,J,L	
	3	A,B,C,E,F,G,H	A,B,C,D,E,F,G,H I,J,K,L,M,N	B,E,H,J,K,N O,P	
	4	A,B,C,E,F,G,H	A,B,C,D,G,H,I,J,K,M	B,E,H,J,K,N,O	
	5	A,B,G,H	A,B,H,J,K	A,H,I,J,L	
	6	G,H	H,K	A,H,I,J,L	
	7	G,H	H,K	A,H,I,J,L	
	9	G,H	H,K	A,H,I,J,L	
	8	G,H	H,K	A,H,I,J,L	
	10	G,H	H,K	A,H,I,J,L	
	12	B,C,E,F,G,H,I,J	B,C,D,E,F,H,I K,M,N	B,D,E,H,J,K,N	
	13	A,B,C,E,F,G,H,I	A,B,C,D,F,H,I,J,K L,M	B,E,H,J,K,N,O	
	14	A,B,C,E,F,G,H	A,B,C,D,F,G,H,I,J K,L,M	B,E,H,J,K	
	23	A,B,C,F,G,H,I,J,K	A,B,C,G,H,K,M	B,H,J,K,N	
	24	G,H,I,K	H,K	A,H,I,J,L	
	25	G,H,I,K	H,K	A,H,I,J,L	
	26	G,H,I,K	H,K	A,H,I,J,L	
	28	G,H	H,K	C,H,I,J,L	
	33	G,H,I,J,K	H,K	B,E,H,J,K,N	
	54	A,B,C,E,F,G,H	A,B,C,D,E,F,G,H J,K,M	A,H,I,J,L	
213	D3	A,B,C,E,F,G,H	A,B,C,D,F,G,H,I J,K,L,M	B,E,F,H,J,K,N O,P	
213	D4	A,B,C,E,F,G,H	A,B,C,D,F,G,H,I J,K,L,M,N	B,E,F,H,J,K,N O,P	
	6	A,B,C,E,F,G,H	A,B,C,D,F,H,K,L,M	B,E,H,J,K,N,O,P	
	7	A,B,C,E,F,G,H	A,B,C,D,F,G,H,I,J K,L,M	B,E,H,J,K,N,O,P	
	44	A,B,C,E,F,G,H	A,B,C,D,F,G,H,I,J K,L,M	A,E,H,J,L,M	
	55	A,B,C,E,F,G,H	A,B,C,D,F,G,H,I,J K,L,M	B,H,J,K,N,O	
	152	A,B,C,E,F,G,H	A,B,C,D,F,G,H,I,J K,L,M	B,E,H,J,K,N,O	
	153	A,B,C,E,F,G,H	A,B,C,D,F,G,H,I,J K,L,M		

**HARVEST UNIT MITIGATION/ENHANCEMENT METHODS  
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<u>VCU</u>	<u>Unit #</u>	<u>Recreation</u>	<u>Visual</u>	<u>Wildlife</u>	<u>Soil</u>
214	7	G,H	H,L	A,H,I,J,L,P	
	8	G,H,I	H,K	L,H,I,J,L	
	3	G,H,I	H,K	A,H,I,J,L	
	1	G,H,K	H,K	A,C,H,I,J,L	
	2	G,H	H,K	A,H,I,J,L	
	3	G,H	H,K	A,H,I,J,L	
	10	G,H,I,K	H,K	A,E,H,J,K,N,O	
215	65	G,H,	H,K	A,H,I,J,L	C,E,F,O,Q
	OH17	A,B,C,E,F,G,H,I	A,B,C,D,F,H,J,K,M	B,E,H,J,K,N,O	
	6	G,H	H,K	H,I,J,L	
	5	G,H	H,K	A,H,I,J,L	
	38A	G,H,J,K	H,K	C,G,I,J,L	
	64	G,H	B,H,K	A,H,I,J,L	C,E,J,L,L1,L2
	66	G,H,J	H,K	A,H,I,J,L	
	180	G,H -	H,K	A,G,I,J,L	
	63	G,H	H,K	A,H,I,J,L	C,E,J,L,L2,O,Q
	60	G,H,K	C,H,K	C,E,G,J,K,M,O	C,E,I,L,L1,L2
	67	C,G,H,J	C,H,K	A,E,G,I,J,K,M	
	13	A,B,C,E,G,H,	A,B,C,D,F,H,K,M	B,E,H,J,K,N,O,P	
	12	A,B,C,E,G,H	A,B,C,D,F,H,K,M	B,E,H,J,K,N,O	
	8	G,H		A,G,I,J,L	
	16	A,B,C,E,G,H,I,K	A,B,C,D,F,H,K,M	E,H,J,K,M,O	
217	42	G,H,L	H,K	J,K,N,O	C,E,I,L,L1,L2,O,Q
	3	G,H,L	B,H,K	B,G,J,K,N,O	
	56	G,H	B,H,K	G,I,J,L	
218	25	G,H,L	H,K	A,G,J,L	
	24	G,H	H,K	A,G,I,J,L	D,E,I,O
	23	G,H,I	H,K	A,G,I,J,L	C,E,I,L
	22	G,H,I,L	H,K	A,G,J,L	C,E,F,I,L
	21	G,H,I,L	H,K	A,G,I,J,L	
	29	B,G,H	B,H,K	A,G,I,J,L	
	19	J	B,C,H,K	A,G,I,J,L	
	31	B,G,H,I	B,C,D,F,H,K,M	A,H,I,J,L	
218	106	B,G,H	A,B,C,D,H,K	A,G,I,J,L	D,H
	33	G,H,L	H,K	A,G,I,J,L	H,N
	35	B,G,H	A,B,C,D,H,K,M	A,G,J,L	D,H
	34	B,G,H,L	B,H,K	C,G,J,K,O	D,K,N
	28	J	H,K	A,G,I,J,L	
219	2	B,G,H,I	B,D,H,K,M	B,E,H,J,K,N,O	
	3	B,G,H,I	A,B,D,H,K,M	B,E,H,J,K,N,O	
	36	A,B,C,E,G,H,I	A,B,D,F,H,I,K,M	B,G,J,K,N,O	
	155	A,B,C,E,F,G,H,I	A,B,C,D,F,G,H,I	B,E,G,H,J,K,N,O	D,G,H,P,Q
			J,K,M		
	154	A,B,C,E,F,G,H,I	A,B,C,D,F,G,H,I,J	B,E,H,J,K,N,O	D,E,L,N
			K,M		

ROAD MITIGATION/ENHANCEMENT METHODS  
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<u>RD #</u>	<u>SILVI-CULTURE</u>	<u>SOILS</u>	<u>WILD-LIFE</u>	<u>VISUALS</u>	<u>FISHERIES/WATER QUALITY</u>	<u>REC.</u>
86104	A	A,B,C,D,E,F G,H,I,K,N,O	B,C1,C4	A,B,C,D,E,G,H	A,B,C,D,E,F	A,B,C,D
85103	A,B	E,F,H,I	A,C2	A,C,D,E,F,G,H		A,B,C,D
853041	A	E,F,H,I,O	B,C1,C4	A,C,D,E,F,G,H	D,E	A,B,C,D
86105	A	A,B,D,E,F,G H,I,O	B,C1,C4	A,C,D,E,F,G,H		A,B,C,D
85765	A,B	E,F,H,I,J	B,C2,C4	A,D,E,G,H		A,C,D
85764	A	E,F,H,I,J,O	A,C2	D,G		C,D
85761	A	E,F,H,I,J,O	B,C2	D,G		C,D
85381	A	E,F,H,I,O	B,C2,C4	D,G		C,D
8538	A,B	E,G,H,I,J,N,O	B,C2,C4	D,G		C,D
85367	A	H,I,J	A,C2	A,D,E,G,H		A,C,D
85364	A,B	E,F,H,I,O	A,C2	D,G		C,D
853643	A		A,C2	A,C,D,E,F,G,H		A,B,C,D
85366	A	A,B,C,D,E,F,G H,I,N,O	A,C2	A,D,E,G,H		
85361	A	H,I,J	B,C2	A,D,E,G,H		A,C,D
85362	A	B,E,F,H,I,K	A,C2	A,D,E,F,G,H	B,C,D,E	A,C,D
85308	A	E,F,H,I	A,C2	D,G		C,D
85307	A		A,C2	D,G		C,D
85342	A	E,F,H,I,J	A,C2	D,G		C,D
853645	A		A,C2	D,G		C,D
85092						F
8504	A	A,B,D,E,F,G,H I,J,N,O	B,C2	B,D,E,G,H,I	A,B,C,D,E,F	C,D,F,G
8576	A,B	E,F,H,I,J	B,C2	D,G		C,D,F,G
8504X	A	E,F,H,I,J	B,C1,C4	H,I		F,G
8502	A	D,E,F,G,H,I,J,N,O	B,C3	B,D,E,G,H,I	A,B,C,D,E,F	C,D,F,G
8534	A	E,F,I,J,O	A,C2	A,C,D,E,F,G,H	C,D,E	A,C,D,F
8536			B,C2	A,B,D,E,F,G,H		A,C,D,E,F
8530		E,F,G,H,I	B,C1,C4	A,B,C,D,E,F,G,H		A,B,C,D,F
85093	A,B	E,F,H,I,J,N,O	A,C2	A,D,G,H,I		A,C,D,E,F
85091	A,B	E,F,G,H,I	B,C2	D,G		C,D,E
85029	A	B,D,E,F,G,H I,J,N,O	B,C2	B,D,E,G,H,I		C,D
850831	A		B,C2			
85102	A,B		A,C2			
86101	A	A,B,C,D,E,G H,I,J,N,O	A,C2			
86102	A	A,B,D,G,I,O	A,C2			
8610	A,B	F,H,I,J	B,C2,C4		D,E	
850931	A	A,B,E,F,H,I,J,N	B,C2	D		C,E,F
85082	A	C,E,F,H,I,J,N	B,C2			C,D,E,F
85291	A		B,C1,C4	A,B,C,D,E,F,G,H		A,B,C,D
85192	A		B,C2	D,G		C,D
8529			B,C1,C4	A,B,C,D,E,F,G,H		A,B,C,D
85171	A	A,B,D,G,H,I,N,O	B,C1,C4	D,G		C,D
8517	A	A,C,D,G,I,N,O	B,C1,C4	D,G		C,D
85341	A,B		A,C2	D,G		C,D
85292	A		B,C1,C4	A,B,C,D,E,F,G,H		A,B,C,D
85293			B,C1,C4	A,B,C,D,E,F,G,H		A,B,C,D
8530154	A		B,C2,C4	A,C,D,E,F,G,H		A,B,C,D

O = Handwritten comment

SOILS AND WATER QUALITY GUIDELINES FOR SEIS ROAD CARDS

- A. \_\_\_\_\_ DESIGN SIDESLOPE CUTS AND FILLS IN UNSTABLE AREAS TO AVOID EXCESSIVE SOIL DISPLACEMENT.
- B. \_\_\_\_\_ MINIMIZE CONCENTRATION OF ROAD RUNOFF TO PREVENT SATURATION OF FILLS.
- C. \_\_\_\_\_ IN EXTREMELY UNSTABLE AREAS USE FULL BENCH DESIGN WITH ENDHAUL OF SPOILS.
- D. \_\_\_\_\_ ON UNSTABLE AREA'S LIMIT BLASTING AND USE OF HEAVY EQUIPMENT IN ROAD PIONEERING WHEN SATURATED SOIL CONDITIONS EXIST.
- E. \_\_\_\_\_ AVOID LARGE FILL SLOPES ADJACENT TO STREAM COARSES.
- F. \_\_\_\_\_ KEEP EQUIPMENT OPERATION IN STREAMS AND ON UPPER BANKS TO A MINIMUM
- G. \_\_\_\_\_ INTENSIVE ROAD DRAINAGE MAINTENANCE REQUIRED OR PUT ROAD TO BED AND REMOVE DRAINAGE STRUCTURES.
- H. \_\_\_\_\_ DIRECT ROAD RUNOFF INTO FILTER AREAS RATHER THAN INTO STREAMS.
- I. \_\_\_\_\_ GRASS SEED AND FERTILIZE AREAS OF EXPOSED SOIL WITHIN THE FIRST GROWING SEASON.
- J. \_\_\_\_\_ LOCATE ROADS PARALLELING STREAMS OR LAKES AT A DISTANCE SUFFICIENT TO PREVENT INTRODUCTION OF SEDIMENT INTO SURFACE WATERS.
- K. \_\_\_\_\_ EXTREMELY FINE-TEXTURED MARINE TERRACE SOILS (BLUE CLAY) OCCUR ALONG ROAD RIGHT OF WAY.
- L. \_\_\_\_\_ COMPACT TILL OCCURS ALONG ROAD RIGHT OF WAY.
- M. \_\_\_\_\_ VOLCANIC ASH SOILS OCCUR ALONG ROAD RIGHT OF WAY.
- N. \_\_\_\_\_ ROAD LOCATION REQUIRES FIELD REVIEW BY WATERSHED SPECIALIST.

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SOILS INPUT TO SEIS PHOTO REVIEW

- A.  ON GROUND SITE SPECIFIC SOILS DATA HAS BEEN FOR THIS UNIT.
- B.  NO SOILS RELATED CONCERNS FOUND DURING PHOTO REVIEW.
- C.  ON GROUND SOILS REVIEW REQUESTED DURING UNIT LAYOUT.
- D.  ON GROUND SOILS REVIEW IF UNIT LAYOUT CREW DETERMINES A NEED.
- E.  OVERSTEEPEND SLOPES INDICATE EXTREME MASS WASTING HAZARD.
- F.  LANDSLIDES ARE ACTIVE/HISTORIC IN THIS AREA.
- G.  WINDTHROW IS A RISK.
- H.  UNIT LAYOUT LACKS ADEQUATE DEFLECTION.
- I.  SHALLOW/INADEQUATELY DRAINED SOILS INDICATE MASS WASTING HAZARDS.
- J.  YEARLY SNOW AVALANCHE OCCURS IN THIS AREA.
- K.  FLOODING IS FREQUENT IN THIS AREA.
- L.  MAJOR/MINOR UNIT DESIGN MODIFICATION NEEDED:
  - M.  AS INDICATED ON UNIT LAYOUT PHOTO
  - N.  TO AVOID HIGH HAZARD SOILS
  - O.  TO AVOID BLIND LEADS THAT RESULT IN SIGNIFICANT SOIL DISTURBANCE
  - P.  TO AVOID YARDING ACROSS UNSTABLE V-NOTCH SIDESLOPES
  - Q.  TO INSURE WINDFIRM BOUNDARY
- R.  SHRUB COMPETITION LIKELY
- S.  <20% SLOPES MAY LACK DEFLECTION IN CABLE YARDING. AREAS THAT MEET SHOVEL
- T.  YARDING CRITERIA SHOULD BE SO YARDED TO REDUCE SOIL DISTURBANCE AND  
REDUCE BRUSH COMPETITION.
- U.  FULL SUSPENSION HARVEST SYSTEM NEEDED TO REDUCE IMPACT TO SOIL
- V.  ENSURE ONE END LOG LIFT
- W.  SPLIT YARD AWAY FROM V-NOTCH
- X.  NO FURTHER SOILS REVIEW MAY BE NEEDED.

SILVICULTURE

- A. GRASS SEED ROAD RUNNING SURFACE, CUTBANKS AND FILL SLOPES AFTER HARVEST IS COMPLETED TO REDUCE THE FREQUENCY OF ALDER SEED SOURCES AND PROTECT THE ROADBED INVESTMENT.
- B. MAINTAIN VEHICULAR ACCESS FOR 5 YEARS AFTER HARVEST IS COMPLETED.
- C. NO CONCERN

## WILDLIFE RESOURCE MITIGATION/ENHANCEMENT METHODS

VUC NO. \_\_\_\_\_ UNIT NO. \_\_\_\_\_ PROPOSED BY: \_\_\_\_\_ DATE \_\_\_\_\_

THE FOLLOWING IS A LIST OF APPROPRIATE MANAGEMENT GUIDELINES, MITIGATION & ENHANCEMENT METHODS AND ENVIRONMENTAL CONSEQUENCES TO BE CONSIDERED DURING UNIT AND ROAD LAYOUT & CONSTRUCTION, LOGGING OPERATIONS AND SALE AREA IMPROVEMENT WORK:

- \_\_\_\_\_ A. UNIT DOES NOT LIE WITHIN EMPHASIS SPECIES HABITAT.
- \_\_\_\_\_ B. UNIT IS WITHIN DEER WINTER RANGE.
- \_\_\_\_\_ C. UNIT LIES WITHIN RIPARIAN HABITAT.
- \_\_\_\_\_ D. UNIT IS LOCATED IN A ESTUARY BUFFER ZONE.
- \_\_\_\_\_ E. THIS UNIT IS LOCATED IN AN AREA IDENTIFIED IN THE 1986-90 APC FEIS TO PROVIDE OLD GROWTH HABITAT CONDITIONS THROUGH 1990.
- \_\_\_\_\_ F. A PORTION OF THIS UNIT IS LOCATED IN BEACH FRINGE HABITAT.
- \_\_\_\_\_ G. UNIT IS LOCATED IN AN AREA WHICH HAS BEEN HEAVILY LOGGED IN THE PAST WITH LIMITED HABITAT DIVERSITY.
- \_\_\_\_\_ H. UNIT IS LOCATED IN A PREVIOUSLY UNLOGGED DRAINAGE OR HAS HAD LIMITED MODIFICATION ACTIVITY IN THE PAST.
- \_\_\_\_\_ I. FAVOR TIMBER PRODUCTION OBJECTIVES IN THIS AREA. PROVIDE FOR HABITAT DIVERSITY BY SCHEDULING 5 TO 10 ENTRIES OVER ONE ROTATION PERIOD TO COMPLETE LOGGING OF THE ENTIRE DRAINAGE.
- \_\_\_\_\_ J. RETAIN AT LEAST 2 SNAGS & DOWN LOGS PER ACRE AND UP TO 2 STANDING CULL LOGS THAT ARE LIKELY TO DIE BEFORE THE END OF THE ROTATION PERIOD TO PROVIDE REPLACEMENT SNAGS.
- \_\_\_\_\_ K. PROHIBIT VEHICLE ACCESS TO THIS AREA TO PREVENT WILDLIFE DISTURBANCE IN EMPHASIS SPECIES HABITAT.
- \_\_\_\_\_ L. RESTRICT OR MANAGE ACCESS TO THIS UNIT TO MINIMIZE WILDLIFE DISTURBANCE IF NOT NEEDED TO MEET THE NEEDS OF OTHER RESOURCE NEEDS.
- \_\_\_\_\_ M. PRESCRIBE PRECOMMERCIAL AND COMMERCIAL THINNING TO PRODUCE OLD GROWTH LIKE CONDITIONS AS SOON AS POSSIBLE (150 YEARS).
- \_\_\_\_\_ N. PRESCRIBE PRECOMMERCIAL AND COMMERCIAL THINNING TO PRODUCE A WIND FIRM TIMBER STAND AS SOON AS POSSIBLE (150 YEARS). FAVOR HEMLOCK AND SPACE TREES TO PRODUCE STOUT LATERAL BRANCHES.
- \_\_\_\_\_ O. PRESCRIBE A SANITATION CUT OR LEAVE 3 TO 5 ACRE WINDFIRM ISLANDS WITHIN 600 FT. OF EACH OTHER OR PROVIDE 1 OR 2 LEAVE STRIPS TO PROVIDE A WILDLIFE TRAVEL WAY TO BEACH FRINGE HABITAT.

FISHERIES AND WATER QUALITY GUIDELINES FOR SEIS ROAD CARDS

- A. \_\_\_\_\_ DESIGN ACTIVITIES ON FLOOD PLAINS TO AVOID RISK OF DAMAGE FROM FLOODWATERS AND TO PROTECT FLOODPLAIN FUNCTION AND VALUES.
- B. \_\_\_\_\_ MINIMIZE USE OF EQUIPMENT IN STREAMS, FOLLOW TIMING RESTRICTIONS TO AVOID IMPACTS TO SPAWNING AND INCUBATION.
- C. \_\_\_\_\_ PROVIDE FOR FISH PASSAGE ON ALL STREAMS WITH LESS THAN 4% GRADIENT; EVALUATE POTENTIAL TRADEOFFS FOR NOT PROVIDING PASSAGE ON STREAMS WITH AVERAGE GRADIENTS BETWEEN 4 TO 6%.
- D. ---- LEAVE NATURAL FILTER STRIPS OR SLASH WINDROWS BELOW ROADS TO FILTER SEDIMENT.
- E. \_\_\_\_\_ DESIGN BRIDGE ABUTMENTS TO MINIMIZE DISTURBANCES TO STREAM BANKS.
- F. \_\_\_\_\_ ROAD LOCATION REQUIRES FIELD REVIEW BY AQUATIC SCIENTIST.

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RECREATION RESOURCE MITIGATION/ENHANCEMENT METHODS

VCU NO. \_\_\_\_\_

UNIT NO. \_\_\_\_\_

Proposed by: \_\_\_\_\_

Date: \_\_\_\_\_

During timber harvest unit and road design, the recreation specialist will implement, from the following list the most appropriate methods to be applied in each circumstance, to meet the recreation resource mitigation/enhancement goals.

- \_\_\_\_\_ A. Adjust unit boundaries where possible to reduce apparent size and screen bare harvested ground to minimize impact of harvest clearings.
- \_\_\_\_\_ B. Shape unit boundaries to replicate nearby natural openings and landform shapes.
- \_\_\_\_\_ C. Locate unit boundaries so unit blends with topographic features such as ridges, knobs, benches and swales.
- \_\_\_\_\_ D. Design units and roads in specified areas to open vistas selected during layout. Remove slash from roads and units adjacent to vistas.
- \_\_\_\_\_ E. Locate road to minimize visual impact from key view points.
- \_\_\_\_\_ F. Use full bench cut and end-haul material where slopes are too steep to hold material and/or where residual trees do not provide enough screen to permit road to meet assigned visual quality objective.
- \_\_\_\_\_ G. Locate and design rockpits to minimize visual impacts. Retain screen trees where necessary to meet this objective. Fully rehabilitate rockpit area. This includes grading floor to drain, cleanup and finished grading of overburden and waste rock, seeding and planting.
- \_\_\_\_\_ H. Apply grass seed and fertilizer to all cut and fill banks.
- \_\_\_\_\_ I. Schedule harvest and roadbuilding activities to minimize years during which activities will occur to reduce impacts from noise.
- \_\_\_\_\_ J. Areas with potential recreation values and sites will be analyzed on the ground in advance of unit and road location. Roads, turnouts rockpits and unit boundaries will be designed to protect scenic values of identified recreation sites and to provide where appropriate well designed access to recreation features.
- \_\_\_\_\_ K. Adjust unit boundaries near identified sportfishing areas on stream and lakes to retain approximately 300 ft. of windfirm timber on each side of the waterbody.
- \_\_\_\_\_ L. Identify and adjust unit boundaries to retain old growth recreation/subsistence access corridors to alpine, etc.

\_\_\_\_\_ THIS UNIT HAS NO RECREATION MITIGATION CONCERNS; NO FIELD REVIEW NECESSARY.

RECREATION RESOURCE MITIGATION/ENHANCEMENT METHODS

ROAD NO. \_\_\_\_\_

Proposed by: \_\_\_\_\_

Date: \_\_\_\_\_

During timber harvest unit and road design, the recreation specialist will implement, from the following list the most appropriate methods to be applied in each circumstance, to meet the recreation resource mitigation/enhancement goals.

- \_\_\_\_\_ A. Locate road to minimize visual impact from key view points.
- \_\_\_\_\_ B. Use full bench cut and end-haul material where slopes are too steep to hold material and/or where residual trees do not provide enough screen to permit road to meet assigned visual quality objective.
- \_\_\_\_\_ C. Locate and design rockpits to minimize visual impacts. Retain screen trees where necessary to meet this objective. Fully rehabilitate rockpit area. This includes grading floor to drain, cleanup and finished grading of overburden and waste rock, seeding and planting.
- \_\_\_\_\_ D. Apply grass seed and fertilizer to all cut and fill banks.
- \_\_\_\_\_ E. Schedule harvest and roadbuilding activities to minimize years during which activities will occur to reduce impacts from noise.
- \_\_\_\_\_ F. Areas with potential recreation values and sites will be analyzed on the ground in advance of unit and road location. Roads, turnouts rockpits and unit boundaries will be designed to protect scenic values of identified recreation sites and to provide where appropriate well designed access to recreation features.

\_\_\_\_\_ THIS UNIT HAS NO RECREATION MITIGATION CONCERNS; NO FIELD REVIEW NECESSARY.

VCU NO. \_\_\_\_\_

UNIT NO. \_\_\_\_\_

PROPOSED BY: \_\_\_\_\_

DATE \_\_\_\_\_

During timber harvest unit and road design, the landscape architect will implement, from the following list the most appropriate methods to be applied in each circumstance, to meet the visual quality objectives (VQO) assigned to the 86-90 Operating Period of the APC Long Term Timber Sale area. The following mitigation measures have all proven to be effective in reducing adverse visual impacts resulting from timber harvest and road building activities.

- \_\_\_\_\_ A. Shape unit boundaries where possible to reduce apparent size and screen bare harvested ground to minimize impact of harvest clearings.
- \_\_\_\_\_ B. Shape unit boundaries to replicate nearby natural openings and landform shapes
- \_\_\_\_\_ C. Locate unit boundaries so unit blends with topographic features such as ridges, knobs, benches and swales.
- \_\_\_\_\_ D. Shape unit boundaries to hide unit backlines and other edges.
- \_\_\_\_\_ E. Design units and roads in specified areas to open vistas selected during layout. Remove slash from roads and units adjacent to vistas.
- \_\_\_\_\_ F. Locate road to minimize visual impact from key view points.
- \_\_\_\_\_ G. Use full bench cut and end-haul material where slopes are too steep to hold material and/or where residual trees do not provide enough screen to permit road to meet assigned visual quality objective.
- \_\_\_\_\_ H. Locate and design rockpits to minimize visual impacts. Retain screen trees where necessary to meet this objective. Fully rehabilitate rockpit area. This includes grading floor to drain, cleanup and finished grading of overburden and waste rock, seeding and planting.
- \_\_\_\_\_ I. Landscape architect and project engineer will work on a case by case basis to limit R.O.W. clearing to a minimum as cut and fill slopes permit.
- \_\_\_\_\_ J. Mitigate the effects of sidecast slash within 30' of the road shoulders by the most appropriate of the following methods - 1) endhaul slash to a central, approved area, and 2) pile slash in non-impacting areas. Consolidate slash as much as practicable, cover with soil, and shape to a natural contour.
- \_\_\_\_\_ K. Apply grass seed and fertilizer to all cut and fill banks, and all abandoned roads.
- \_\_\_\_\_ L. Burn unit to reduce the adverse effects of color contrast within the first 3 years after unit harvest.
- \_\_\_\_\_ M. Landscape Architect required on site during layout of unit/road to provide assistance in addressing visual concerns.

VISUAL RESOURCE MITIGATION/ENHANCEMENT METHODS

ROAD NO. \_\_\_\_\_

PROPOSED BY: \_\_\_\_\_

DATE \_\_\_\_\_

During timber harvest unit and road design, the landscape architect will implement, from the following list the most appropriate methods to be applied in each circumstance, to meet the visual quality objectives (VQO) assigned to the 86-90 Operating Period of the APC Long Term Timber Sale area. The following mitigation measures have all proven to be effective in reducing adverse visual impacts resulting from timber harvest and road building activities.

- \_\_\_\_\_ A. Locate road to minimize visual impact from key view points.
- \_\_\_\_\_ B. Adjust clearing limits and road location as needed to provide viewpoints in designated locations.
- \_\_\_\_\_ C. Use full bench cut and end-haul material where slopes are too steep to hold material and/or where residual trees do not provide enough screen to permit road to meet assigned visual quality objective.
- \_\_\_\_\_ D. Locate and design rockpits to minimize visual impacts. Retain screen trees where necessary to meet this objective. Fully rehabilitate rockpit area. This includes grading floor to drain, cleanup and finished grading of overburden and waste rock, seeding and planting.
- \_\_\_\_\_ E. Landscape architect and project engineer will work on a case by case basis to limit R.O.W. clearing to a minimum as cut and fill slopes permit.
- \_\_\_\_\_ F. Mitigate the effects of sidecast slash within 30' of the road shoulders by the most appropriate of the following methods - 1) endhaul slash to a central, approved area, and 2) pile slash in non-impacting areas. Consolidate slash as much as practicable, cover with soil, and shape to a natural contour.
- \_\_\_\_\_ G. Apply grass seed and fertilizer to all cut and fill banks, and all abandoned roads.
- \_\_\_\_\_ H. Landscape Architect required on site during layout of road to provide assistance in addressing visual concerns.

## CULTURAL RESOURCE MITIGATION/ENHANCEMENT METHODS

Cultural Resources will not be impacted by ground disturbing activities. Cultural resource technicians will evaluate and clear unit prior to activities based on design criteria evaluated by the SHIPO. Those units previously cleared in the 86-90 FEIS will be reevaluated based on the new criteria in the SEIS design plan submitted to SHIPO.

**81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS.)**

VCU <u>203</u>	EIS UNIT # <u>126</u>	ACRES <u>125</u>	LOGGING SYSTEM <u>Hl</u>	SILVICULTURE	OBJECTIVE / PRESCRIPTION: Clearcut hazard buffer with natural regeneration. This is a high productivity area with a cover of 97% (Fav). Remove by regeneration and precommercial thin at a rate 12-18 yrs, with a timber emphasis leave an average of 2 stumps per acre for diversity.
STAND #	VOLUME FEIS	3060	VOLUME CRUISE		
SALE NAME <u>AA03</u>	MAP SITKA D5				
PHOTO LINE AND NUMBER <u>27B 235</u>					
OBJECTIVES				HIGH HAZARD AREA	OBJECTIVE / PRESCRIPTION:
				<i>See Attached Plan</i>	
RESULTS OF MONITORING:					
ROAD LOCATION AND OBJECTIVE	CLOSED ROAD	OPEN ROAD	OBJECTIVE / PRESCRIPTION:		
PLANNED (ORTHO PHOTO)	SCALE: _____		<i>Centrally located Access</i>		
FISHERIES / HYDROLOGY	CLASS I CROSSING <u>L</u>	CLASS II CROSSING	CLASS III CROSSING		
WATER QUALITY	FMHU <u>I</u>	TEMPERATURE	SENSITIVITY: YES <u>—</u> NO <u>—</u>		
WILDLIFE	IN HABITAT FOR OLD GROWTH SPECIES <u>NO</u>	See Attached			
WILDLIFE	IN HABITAT FOR OLD GROWTH SPECIES <u>NO</u>	See Attached			
VISUAL RECREATION	OBJECTIVE / PRESCRIPTION:	<i>See Attached</i>			
CULTURAL	KNOWN SITE	PROBABILITY ZONE: HIGH	MEDIUM	OBJECTIVE / PRESCRIPTION:	
LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION: Highlead yard. Split Settings to yard away from V-notch. Protect Class I stream and buffer along E boundary. Suggest making wildlife leave strip wider due to windthrow hazards. Add additional area along N boundary to balance out acres.				
REMARKS	<i>Recreation: Tree at Head of L</i>				

## 81-90 SEIS UNIT LAYOUT MITIGATION AND EFFECTIVENESS

<u>RESOURCE GROUP</u>	<u>MITIGATION MEASURE</u>	<u>ANTICIPATED EFFECTIVENESS</u>
SILVICULTURE		
SOILS		
ROAD LOCATION & OBJECTIVE		
FISHERIES/HYDROLOGY	<p>① 5pl.4 yard V-notches per soil profile precipitation ② Maintain 100' buffer along SW. unit boundary adjacent to Class II stream.</p>	90% effective
WILDLIFE		
VISUAL/RECREATION		
CULTURAL		
LOGGING SYSTEM		

S - 90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81 - 90 SEIS)

OBJECTIVES Provide volume for the 86-  
operating period.

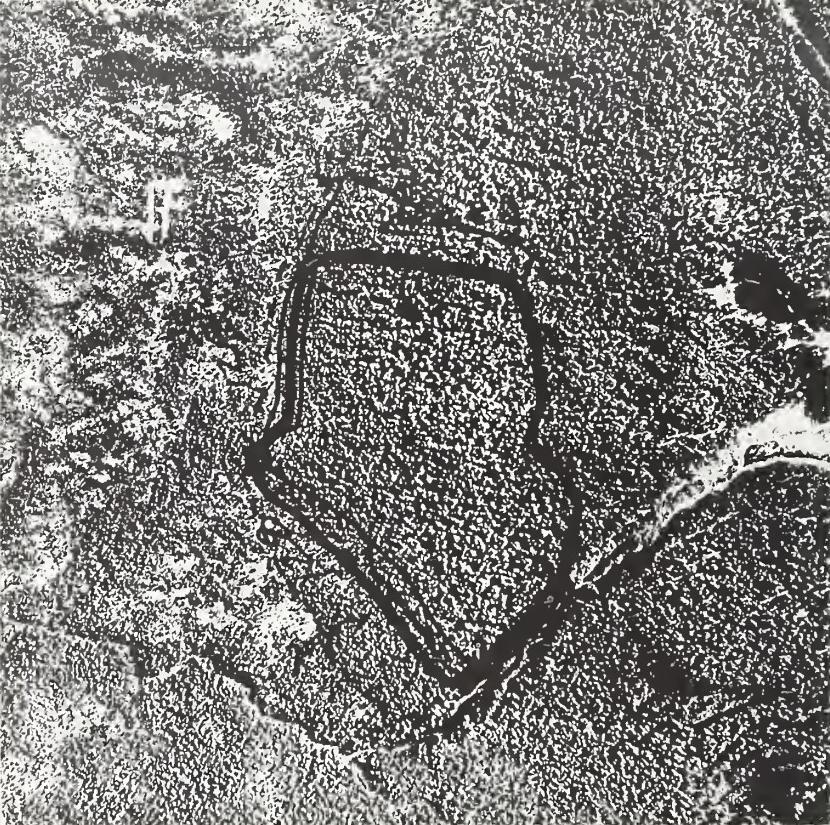
STAND #	EIS UNIT *	ACRES	LOGGING
203	127	144	VOLUME CRUISE
	VOLUME FEIS	4.186	
	SALE NAME	MAP 5	
	PHOTO LINE AND NUMBER	SD5	278-235

<p><b>OBJECTIVES</b> Provide Volume for the 86-90 operating period.</p> <p><b>EIS UNIT #</b> 203    <b>ACRES</b> 127    <b>LOGGING SYSTEM</b> HL</p> <p><b>STAND #</b> VOLUME FEES 4186    <b>VOLUME CRUISE</b> —</p> <p><b>SALE NAME</b> AA03    <b>MAP# SD5</b></p> <p><b>PHOTO LINE AND NUMBER</b> 27B-235</p>						<p><b>OBJECTIVE / PRESCRIPTION:</b> Clement harvest followed by artificial regeneration to Sitka Spruce (seedwall seasons not planting as well as highly disturbed valley bottom). Alder and Salal may be considered as part of the harvest to keep disturbance to a minimum is essential if the community's species diversity &lt; 2000. Also consider full suspension L-S on west side of unit. <del>Skagway</del> a cross creek. Retain 1m buffer for future timber harvesting. <del>High hazard area</del></p> <p><b>SOILS</b> HIGH HAZARD AREA</p> <p><b>OBJECTIVE / PRESCRIPTION:</b></p>									
<p><b>RESULTS OF MONITORING:</b></p> <table border="1"> <tr> <td><b>ROAD LOCATION</b></td> <td><b>CLOSED ROAD</b></td> <td><b>OPEN ROAD</b></td> <td><b>OBJECTIVE / PRESCRIPTION:</b></td> </tr> <tr> <td>AND OBJECTIVE</td> <td colspan="2">Controlled Access</td> <td></td> </tr> </table>						<b>ROAD LOCATION</b>	<b>CLOSED ROAD</b>	<b>OPEN ROAD</b>	<b>OBJECTIVE / PRESCRIPTION:</b>	AND OBJECTIVE	Controlled Access			<p><b>SILVICULTURE</b> CLASS I CROSSING <u>1</u> CLASS II CROSSING <u>1</u> CLASS III CROSSING —</p> <p>as well as highly disturbed valley bottom. Alder and Salal may be considered as part of the harvest to keep disturbance to a minimum is essential if the community's species diversity &lt; 2000. Also consider full suspension L-S on west side of unit. <del>Skagway</del> a cross creek. Retain 1m buffer for future timber harvesting. <del>High hazard area</del></p> <p><b>FISH &amp; WILDLIFE</b> FISH HABITAT IN CLASS II CHANNEL TYPE</p> <p><b>WILDLIFE</b> IN HABITAT FOR OLD GROWTH SPECIES NO see attached</p> <p><b>VISUAL RECREATION</b> SEE ATTACHED PHOTO IF PRACTICABLE.</p> <p><b>CULTURAL</b> KNOWN SITE — PROBABILITY ZONE : HIGH — MEDIUM —</p> <p><b>OBJECTIVE / PRESCRIPTION:</b></p>	
<b>ROAD LOCATION</b>	<b>CLOSED ROAD</b>	<b>OPEN ROAD</b>	<b>OBJECTIVE / PRESCRIPTION:</b>												
AND OBJECTIVE	Controlled Access														
<p><b>PLANNED (ORTHO PHOTO)</b></p>						<p><b>FISHERIES / HYDROLOGY</b> FMU <u>1</u> TEMPERATURE SENSITIVITY : YES — NO <u>X</u></p> <p><b>OBJECTIVE / PRESCRIPTION:</b> MAINTAIN WATER QUALITY AND CLASS II CHANNEL, AGAINST MAINSTREAM FISH HABITAT IN CLASS II CHANNEL TYPE. Diversional fallow from main channel. Sept 9/89.</p> <p><b>WILDLIFE</b> IN HABITAT FOR OLD GROWTH SPECIES NO see attached</p> <p><b>VISUAL RECREATION</b> SEE ATTACHED PHOTO IF PRACTICABLE.</p> <p><b>CULTURAL</b> KNOWN SITE — PROBABILITY ZONE : HIGH — MEDIUM —</p> <p><b>OBJECTIVE / PRESCRIPTION:</b></p>									
						<p><b>LOGGING SYSTEM</b> Portions of unit appear suitable for shovel yarding. protect Class I stream and buffer which runs through unit. Protect Class III stream and buffer in unit. Crabsinski yard with one end suspended in eastern portion of unit. High load yard rest.</p> <p><b>REMARKS-</b> See Ortho Photo</p>									

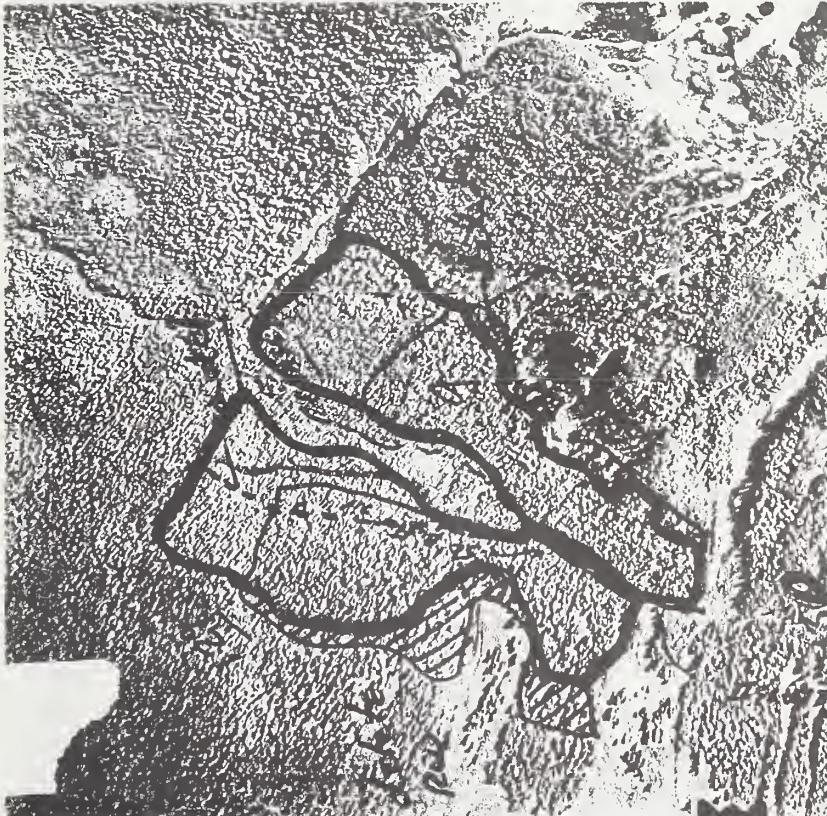
## 81-90 SEIS UNIT LAYOUT MITIGATION AND EFFECTIVENESS

RESOURCE GROUP	MITIGATION MEASURE	ANTICIPATED EFFECTIVENESS
SILVICULTURE		
SOILS		
ROAD LOCATION & OBJECTIVE		
FISHERIES/HYDROLOGY	<p>① Directional fall and split yard large Class III channel on Eastern portion of unit 127.</p> <p>② Maintain 100 ft Buffer zone along both sides of Class I channel.</p>	<p>80% effective</p> <p>90% effective</p>
WILDLIFE		
VISUAL/RECREATION		
CULTURAL		
LOGGING SYSTEM		

# 81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS.)

VCU <u>203</u> STAND # <u>1</u> SALE NAME <u>AB 03 MAP # SD5</u> PHOTO LINE AND NUMBER <u>26B-38.</u>	<b>EIS UNIT #</b> <u>128</u> · <b>ACRES</b> <u>12.3</u> ✓ <b>LOGGING SYSTEM</b> <u>HLL</u> <b>VOLUME FEIS</b> <u>2943</u> <b>VOLUME CRUISE</b> — <b>OBJECTIVES</b> <u>Provide volume for the 86-90 operating period,</u>	<b>SILVICULTURE</b> <u>Objective / Prescription: Clearcut harvest followed with natural regeneration. This is a highly productive site (site index 100 ft). Monitor regeneration and permanently thin at ages 10-18 yrs with a timber emphasis. Retain an average of 2 snags per acre for diversity,</u>  <b>SOILS</b> <u>HIGH HAZARD AREA</u> — <b>OBJECTIVE / PRESCRIPTION:</b> <i>See Attached</i>									
<b>RESULTS OF MONITORING:</b>											
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;"> <b>ROAD LOCATION</b>  <u>Closed Road</u> </td> <td style="width: 30%;"> <b>CLOSED ROAD</b> — <b>OPEN ROAD</b> — <b>OBJECTIVE / PRESCRIPTION:</b>  <i>Conserve Roads</i> </td> <td style="width: 40%;"> <b>FISHERIES / HYDROLOGY</b> <u>CLASS I CROSSING</u> — <u>CLASS II CROSSING</u> — <u>CLASS III CROSSING</u> —  <u>FHMU</u> — <b>TEMPERATURE SENSITIVITY:</b> YES — NO —  <b>OBJECTIVE / PRESCRIPTION:</b>  <i>No concerns Identified</i> </td> </tr> <tr> <td colspan="2"> <b>WILDLIFE</b> <u>IN HABITAT FOR OLD GROWTH SPECIES</u> — <u>NO</u> <u>(See Attached)</u>  <b>OBJECTIVE / PRESCRIPTION:</b>  <i>Large unit.</i> </td> <td> <b>VISUAL RECREATION</b> <u>OBJECTIVE / PRESCRIPTION:</u> <u>SEE ATTACHED</u>  <i>Unit does not meet assigned VGO of Mod.</i> </td> </tr> <tr> <td colspan="2"> <b>CULTURAL</b> <u>KNOWN SITE</u> — <b>PROBABILITY ZONE :</b> HIGH — MEDIUM —  <b>OBJECTIVE / PRESCRIPTION:</b> </td> <td> <b>LOGGING SYSTEM</b> <u>OBJECTIVE / PRESCRIPTION:</u> Highlead yard. Yard away from V-notch on western boundary of unit.  <b>REMARKS</b> <u>RRZ</u> <u>9/16/89</u>  <i>Removal: See attached</i> </td> </tr> </table>			<b>ROAD LOCATION</b> <u>Closed Road</u>	<b>CLOSED ROAD</b> — <b>OPEN ROAD</b> — <b>OBJECTIVE / PRESCRIPTION:</b> <i>Conserve Roads</i>	<b>FISHERIES / HYDROLOGY</b> <u>CLASS I CROSSING</u> — <u>CLASS II CROSSING</u> — <u>CLASS III CROSSING</u> — <u>FHMU</u> — <b>TEMPERATURE SENSITIVITY:</b> YES — NO — <b>OBJECTIVE / PRESCRIPTION:</b> <i>No concerns Identified</i>	<b>WILDLIFE</b> <u>IN HABITAT FOR OLD GROWTH SPECIES</u> — <u>NO</u> <u>(See Attached)</u> <b>OBJECTIVE / PRESCRIPTION:</b> <i>Large unit.</i>		<b>VISUAL RECREATION</b> <u>OBJECTIVE / PRESCRIPTION:</u> <u>SEE ATTACHED</u> <i>Unit does not meet assigned VGO of Mod.</i>	<b>CULTURAL</b> <u>KNOWN SITE</u> — <b>PROBABILITY ZONE :</b> HIGH — MEDIUM — <b>OBJECTIVE / PRESCRIPTION:</b>		<b>LOGGING SYSTEM</b> <u>OBJECTIVE / PRESCRIPTION:</u> Highlead yard. Yard away from V-notch on western boundary of unit. <b>REMARKS</b> <u>RRZ</u> <u>9/16/89</u> <i>Removal: See attached</i>
<b>ROAD LOCATION</b> <u>Closed Road</u>	<b>CLOSED ROAD</b> — <b>OPEN ROAD</b> — <b>OBJECTIVE / PRESCRIPTION:</b> <i>Conserve Roads</i>	<b>FISHERIES / HYDROLOGY</b> <u>CLASS I CROSSING</u> — <u>CLASS II CROSSING</u> — <u>CLASS III CROSSING</u> — <u>FHMU</u> — <b>TEMPERATURE SENSITIVITY:</b> YES — NO — <b>OBJECTIVE / PRESCRIPTION:</b> <i>No concerns Identified</i>									
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<b>CULTURAL</b> <u>KNOWN SITE</u> — <b>PROBABILITY ZONE :</b> HIGH — MEDIUM — <b>OBJECTIVE / PRESCRIPTION:</b>		<b>LOGGING SYSTEM</b> <u>OBJECTIVE / PRESCRIPTION:</u> Highlead yard. Yard away from V-notch on western boundary of unit. <b>REMARKS</b> <u>RRZ</u> <u>9/16/89</u> <i>Removal: See attached</i>									
											

**81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)**

VCU 203	EIS UNIT #129	ACRES <u>1/46</u>	LOGGING SYSTEM <u>HL</u>	SILVICULTURE OBJECTIVE / PRESCRIPTION: Clean cut harvest between 3 & 4 ha of residuum. The area is highly uneven with a Fair Site Index of 100. This is a regeneration area and conservation will be done with a timber camp plan. Retain an average of 2 sugars per acre for diversity.												
STAND #	VOLUME FEIS	<u>3576</u>	VOLUME CRUISE	Under 100												
SALE NAME	MAP #	<u>SDS</u>		1790 13, 18												
PHOTO LINE AND NUMBER	<u>26B-39</u>															
<u>OBJECTIVES</u> <u>Operating Period</u>	Provide Volume for the 86-90 Operating Period.															
RESULTS OF MONITORING:																
ROAD LOCATION AND OBJECTIVE		CLOSED ROAD — OPEN ROAD — DISCOURSES TRAFFIC	OBJECTIVE / PRESCRIPTION: Allows to Grouse closed													
<table border="1"> <tr> <td>FISHERIES / HYDROLOGY</td> <td>CLASS I CROSSING — THMU <u>II</u> TEMPERATURE SENSITIVITY: YES — NO <u>X</u></td> <td>CLASS II CROSSING <u>I</u> CLASS III CROSSING —</td> </tr> <tr> <td colspan="3">OBJECTIVE / PRESCRIPTION: MAINTAIN RESIDENT FISH HABITAT QUALITY AND WATER QUALITY IN CLASS 2 CHANNEL, A2/B2. Directional pull away from buffer. A2 Class 1 type. St # 9102</td> </tr> <tr> <td>WILDLIFE</td> <td colspan="2">IN HABITAT FOR OLD GROWTH SPECIES <u>NO</u> (see attached)</td> </tr> <tr> <td colspan="3">OBJECTIVE / PRESCRIPTION:</td> </tr> </table>					FISHERIES / HYDROLOGY	CLASS I CROSSING — THMU <u>II</u> TEMPERATURE SENSITIVITY: YES — NO <u>X</u>	CLASS II CROSSING <u>I</u> CLASS III CROSSING —	OBJECTIVE / PRESCRIPTION: MAINTAIN RESIDENT FISH HABITAT QUALITY AND WATER QUALITY IN CLASS 2 CHANNEL, A2/B2. Directional pull away from buffer. A2 Class 1 type. St # 9102			WILDLIFE	IN HABITAT FOR OLD GROWTH SPECIES <u>NO</u> (see attached)		OBJECTIVE / PRESCRIPTION:		
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REMARKS: Recreation: See Attached ✓																
																

81-90 SEIS UNIT LAYOUT MITIGATION AND EFFECTIVENESS

RESOURCE GROUP	MITIGATION MEASURE	ANTICIPATED EFFECTIVENESS
SILVICULTURE		
SOILS		
ROAD LOCATION & OBJECTIVE		
FISHERIES/HYDROLOGY	① maintain 50 ft Buffer on both sides of Class II channel.	80% effectiveness.
WILDLIFE		
VISUAL/RECREATION		
CULTURAL		
LOGGING SYSTEM		

X 81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)

VCU 203	EIS UNIT # 130	ACRES 34	LOGGING SYSTEM <u>Shovel</u>	SILVICULTURE <u>Seedling</u>	OBJECTIVE / PRESCRIPTION: Clear-cut harvested followed by plant of Sitka Spruce. This is a disturbed slope growing lots of water.
STAND #	VOLUME FEIS 1890	VOLUME CRUISE _____	SOIL MAP UNIT S2C4b	SOIL HAZARD AREA	Soil map unit S2C4b is suitable for Shovel landing. Slope is high productivity area with a Can. Site Index of 100. Retain an average of 2 snags per acre for diversity.
SALE NAME 0A03	MAP # SD 5	PHOTO LINE AND NUMBER 26B-39	SOILS	HIGH HAZARD AREA	OBJECTIVE / PRESCRIPTION: See Attached
RESULTS OF MONITORING:					
ROAD LOCATION AND OBJECTIVE		CLOSED ROAD — OPEN ROAD —	OBJECTIVE / PRESCRIPTION:		
PLANNED (ORTHO PHOTO)		SCALE: _____	Discourage traffic Allow to Grass Cross		
OBJECTIVES		Provide Volume for the 86-90 Operating Period.			
FISHERIES / HYDROLOGY	CLASS I CROSSING	CLASS II CROSSING	CLASS III CROSSING	FHMU II TEMPERATURE SENSITIVITY: YES — NO	
OBJECTIVE / PRESCRIPTION: MAINTAIN RESIDENT FISH HABITAT CROWN BUTTERFLY AND WATER QUALITY. Directional fall away A2 chain Type				Crown Butterfly and water quality. Directional fall away	
WILDLIFE	IN HABITAT FOR OLD GROWTH SPECIES <u>NO</u>			SIN 102	
VISUAL RECREATION		OBJECTIVE / PRESCRIPTION: See Attached			
CULTURAL		KNOWN SITE PROBABILITY ZONE: HIGH — MEDIUM — OBJECTIVE / PRESCRIPTION:			
REMARKS		LOGGING SYSTEM OBJECTIVE / PRESCRIPTION: Unit appears suitable for shovel landing. Protect class II stream and buffer running through middle of unit.			
		RRZ 9/16/89			
		Recreation: See Attached			



81-90 SEIS UNIT LAYOUT MITIGATION AND EFFECTIVENESS

RESOURCE GROUP	MITIGATION MEASURE	ANTICIPATED EFFECTIVENESS
SILVICULTURE		
SOILS		
ROAD LOCATION & OBJECTIVE		
FISHERIES/HYDROLOGY	① maintain CLASS II HABITAT WITH 50' Buffer, each side of the channel.	80% effective
WILDLIFE		
VISUAL/RECREATION		
CULTURAL		
LOGGING SYSTEM		

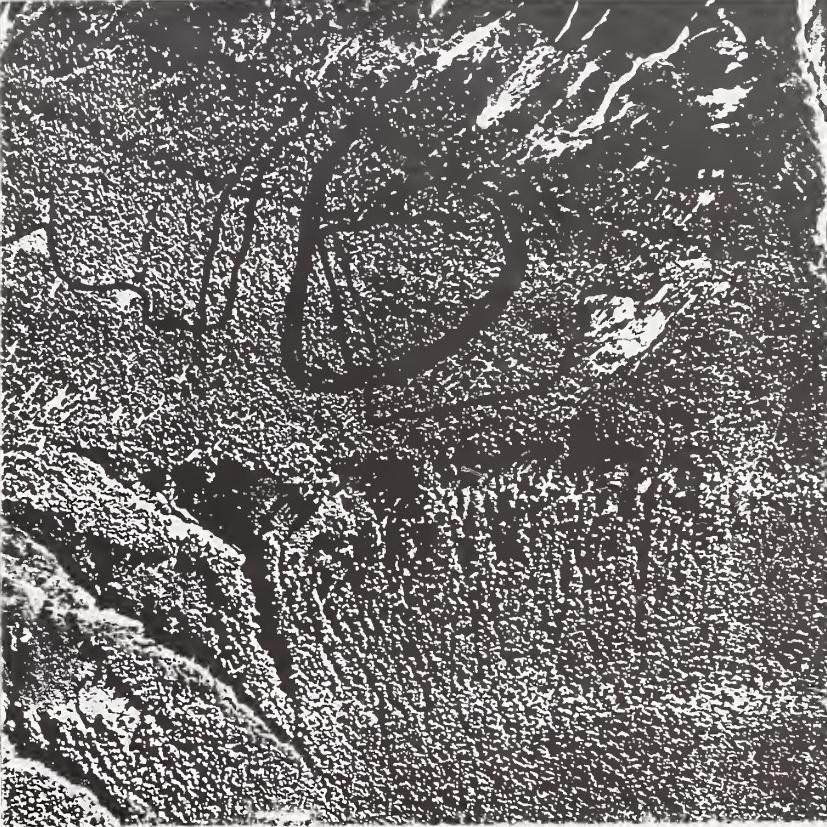
## 81 - 90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81 - 90 SEIS)

<u>EIS UNIT #</u> <u>203</u>	<u>ACRES</u> <u>131</u>	<u>LOGGING SYSTEM</u> <u>HL</u>	<u>SILVICULTURE</u> Plant to Sitka Spruce on N or the 1/3 of unit below older brush fields. Natural regeneration on South 2/3 of unit + have adequate seed wall exists. This is a Change to moderately productive site (SEIS year 78-90) with an average of 90' MSL on regen. and precommercial thin natural regen. portion of unit at 12-18 yrs. of age. Return an area of 2 acre to 2 manage for diversity.																				
<u>STAND #</u> <u>1</u> <u>VOLUME FEIS</u> <u>2544</u> <u>SALE NAME</u> <u>AA D3</u> <u>MAP #</u> <u>SDS</u> <u>PHOTO LINE AND NUMBER</u> <u>25-272</u>																							
<b>OBJECTIVES</b> <i>Provide Volume for the 86-90 Operating Period.</i>																							
<b>PLANNED (ORTHO PHOTO)</b> 		<b>SCALE:</b> _____																					
<b>RESULTS OF MONITORING:</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">ROAD LOCATION AND OBJECTIVE</td> <td style="width: 20%;">CLOSED ROAD</td> <td style="width: 20%;">OPEN ROAD</td> <td style="width: 20%;">OBJECTIVE / PRESCRIPTION:</td> </tr> <tr> <td></td> <td></td> <td></td> <td><i>Discourage traffic allowing to grow</i></td> </tr> <tr> <td></td> <td></td> <td></td> <td><i>Closed</i></td> </tr> </table>				ROAD LOCATION AND OBJECTIVE	CLOSED ROAD	OPEN ROAD	OBJECTIVE / PRESCRIPTION:				<i>Discourage traffic allowing to grow</i>				<i>Closed</i>								
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FISHERIES / HYDROLOGY	CLASS I CROSSING	CLASS II CROSSING	CLASS III CROSSING																				
	<del>FHMU</del>	<del>TEMPERATURE</del>	<del>SENSITIVITY: YES NO</del>																				
<b>OBJECTIVE / PRESCRIPTION:</b> <i>minimize water pass by in channel.</i>																							
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WILDLIFE	IN HABITAT FOR OLD GROWTH SPECIES	NO	OBJECTIVE / PRESCRIPTION:																				
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VISUAL RECREATION	CLASS I CROSSING	CLASS II CROSSING	CLASS III CROSSING																				
	<del>NO</del>	<del>NO</del>	<del>NO</del>																				
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		<i>DR 2 9/16/89</i>																					

## 81-90 SEIS UNIT LAYOUT MITIGATION AND EFFECTIVENESS

RESOURCE GROUP	MITIGATION MEASURE	ANTICIPATED EFFECTIVENESS
SILVICULTURE		
SOILS		
ROAD LOCATION & OBJECTIVE		
FISHERIES/HYDROLOGY	<p>① Split yard class III channel bisecting unit.</p> <p>② Specialist should monitor implementation of effectiveness.</p>	80% effective
WILDLIFE		
VISUAL/RECREATION		
CULTURAL		
LOGGING SYSTEM		

**81 - 90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)**

YCU 203	EIS UNIT # 132	ACRES 49	LOGGING SYSTEM HL	SILVICULTURE Regeneration: Site Productivity ranges from Fair S.I. 80 - 94 with an average of 84. Retain an average of 2 Stands per acre for diversity. Aerials. What timber is being selected logging System? Could we fly logs across best portion of unit & go hauled on slope?	OBJECTIVE / PRESCRIPTION: Clean cut harvest followed by natural regeneration.
STAND #	VOLUME FEIS 1303	VOLUME CRUISE _____	MAP # SD5	SOILS	HIGH HAZARD AREA _____
SALE NAME AA 03	PHOTO LINE AND NUMBER 25 - 272	OBJECTIVES Provide Volume for the 86-90 operating Period	OBJECTIVE / PRESCRIPTION:	S. A.	
RESULTS OF MONITORING:					
ROAD LOCATION AND OBJECTIVE		CLOSED ROAD — OPEN ROAD —	OBJECTIVE / PRESCRIPTION: Disease sample traffic allows to grow Closed		
PLANNED (ORTHO PHOTO)		SCALE: _____	FISHERIES / HYDROLOGY	CLASS I CROSSING — CLASS II CROSSING — CLASS III CROSSING <u>1</u> FHMU <del>III</del> TEMPERATURE SENSITIVITY: YES — NO <input checked="" type="checkbox"/>	
			OBJECTIVE / PRESCRIPTION: Class III channels may indicate water quality in A2 channel type	Sr 1 9/6/92	
WILDLIFE		IN HABITAT FOR OLD GROWTH SPECIES <u>NO</u>	WILDLIFE	VISUAL RECREATION	OBJECTIVE / PRESCRIPTION: <u>SEE ATTACHED</u> and meets assigned VGO of Mod.
CULTURAL		KNOWN SITE _____	PROBABILITY ZONE : HIGH — MEDIUM —	OBJECTIVE / PRESCRIPTION :	
LOGGING SYSTEM		OBJECTIVE / PRESCRIPTION: High lead yard. Split settings to yard away from V-horches. Yard away from Class III stream and buffer in unit. Spur road needs to be built to access timber on top. This area appears suitable to should yarding. RRZ 9/16/89			
REMARKS		Recreation: See A. Hackel J			
					

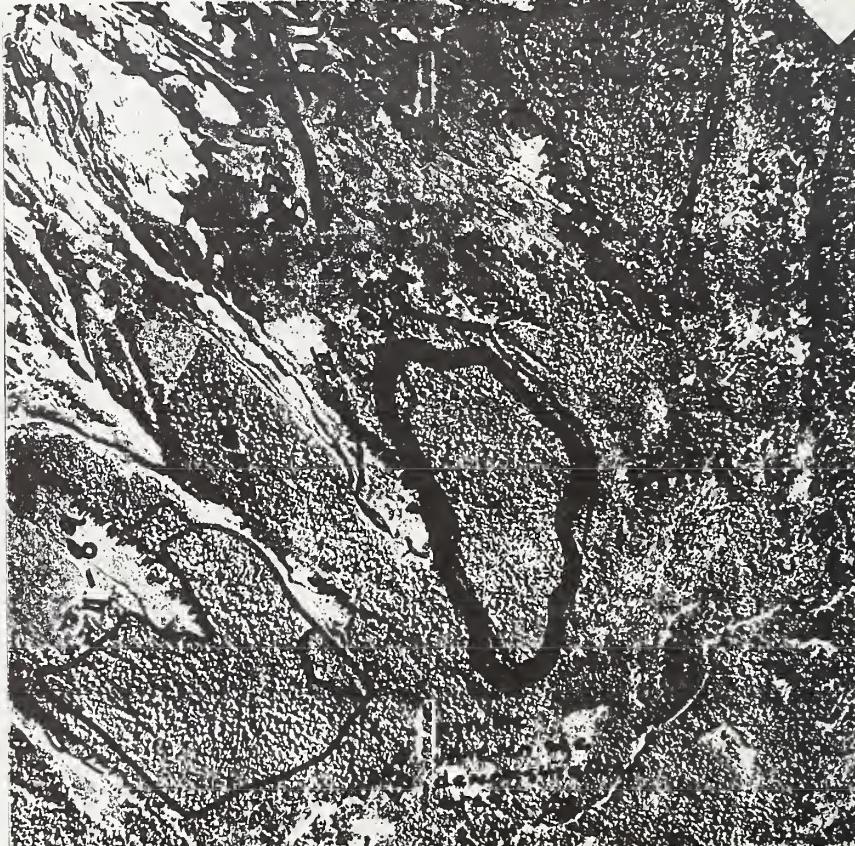
81-90 SEIS UNIT LAYOUT MITIGATION AND EFFECTIVENESS

RESOURCE GROUP	MITIGATION MEASURE	ANTICIPATED EFFECTIVENESS
SILVICULTURE		
SOILS		
ROAD LOCATION & OBJECTIVE		
FISHERIES/HYDROLOGY	<p>① <del>split</del> <sup>yard</sup> (2) Class III channels within unit boundaries.</p>	<p>50% - 80% effective</p>
WILDLIFE		
VISUAL/RECREATION		
CULTURAL		
LOGGING SYSTEM		

**81 - 90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81 - 90 SEIS)**

VCU	204	EIS #	86	ACRES	88	LOGGING SYSTEM	SK	SILVICULTURE	OBJECTIVE / PRESCRIPTION:
STAND #		VOLUME FEIS	4768	VOLUME CRUISE	—	PRESENTATION	Crater		
SALE NAME	AB 03	MAP #	SD5			LAND USE	AGRICULTURE		
PHOTO LINE AND NUMBER						PERMITTING	Planning		
OBJECTIVES Provide volume for the 86-90 operating period.									
RESULTS OF MONITORING:									
ROAD LOCATION AND OBJECTIVE		CLOSED ROAD	OPEN ROAD	OBJECTIVE / PRESCRIPTION:					
CULTURAL ACCESS		All goes to growth closed							
PLANNED (ORTHO PHOTO)									
SCALE: —									
									
FISHERIES / HYDROLOGY	CLASS I CROSSING AHMU III	CLASS II CROSSING	CLASS III CROSSING	OBJECTIVE / PRESCRIPTION:					
TEMPERATURE SENSITIVITY: YES NO X									
OBJECTIVE / PRESCRIPTION: NO concerns identified.									
WILDLIFE	IN HABITAT FOR OLD GROWTH SPECIES	NO		OBJECTIVE / PRESCRIPTION:					
(see attached)									
VISUAL RECREATION	OBJECTIVE / PRESCRIPTION	SEE ATTACHED							
Assessors up to max road. Unmet assigned up to									
CULTURAL	KNOWN SITE	PROBABILITY ZONE	HIGH	MEDIUM	OBJECTIVE / PRESCRIPTION:				
LOGGING SYSTEM									
OBJECTIVE / PRESCRIPTION: Skidder long log									
REMARKS Reservation See Attachment									

SS-116 81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)

VCH 204	EIS # 88	ACRES 66	LOGGING SYSTEM 5K	SILVICULTURE	OBJECTIVE / PRESCRIPTION: Class II crossing. Site in area of VCH 204. Silvicultural prescriptions: fallow land prescriptions. All areas less than 15 Ac in the area will be treated as fallow land. Areas less than 7 Ac will be treated as fallow land.
STAND #	VOLUME FEIS	1056	VOLUME CRUISE		
SALE NAME	PA 03	MA P# 5D5			
PHOTO LINE AND NUMBER	308-366				
<u>OBJECTIVES</u>	Provide Volume for the 81-90 Operations Period. done in field.				
PLANNED (ORTHO PHOTO)	SCALE:				
RESULTS OF MONITORING:					
ROAD LOCATION AND OBJECTIVE	CLOSED ROAD	OPEN ROAD	OBJECTIVE / PRESCRIPTION:		
	Control Access				
FISHERIES / HYDROLOGY	CLASS I CROSSING	CLASS II CROSSING	CLASS III CROSSING	<u>/</u>	
OBJECTIVE / PRESCRIPTION: AHMU III TEMPERATURE SENSITIVITY: YES NO X	Maintain water quality in class II streams.				
Keep North Boundary above V-notch side slope breakwater	Class III channel. A 9 channel type.				
WILDLIFE	IN HABITAT FOR OLD GROWTH SPECIES	NO			
RECREATION	VISUAL	OBJECTIVE / PRESCRIPTION: See Attachment			
	RECREATION	See Attachment			
	WILDLIFE	Affected VQO max wdp.			
CULTURAL	KNOWN SITE	PROBABILITY ZONE : HIGH — MEDIUM —			
LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION: Skidline logging. Remove low and high hazard trees.				
REMARKS	Location: See Attachment				

## 81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)

VIEW 204	EIS UNIT # 89.	ACRES 83	LOGGING SYSTEM	SILVICULTURE	OBJECTIVE / PRESCRIPTION:
STAND #	VOLUME FEIS	2220 <sup>6</sup>	VOLUME CRUISE		
SALE NAME	AP 03	MAP#H	SDS		
PHOTO LINE AND NUMBER					30B-366
OBJECTIVES	Protect Volume in the 56% Old Growth				RRZ 9/16/89
RESULTS OF MONITORING:					
ROAD LOCATION AND OBJECTIVE		CLOSED ROAD	OPEN ROAD	OBJECTIVE / PRESCRIPTION: Control Access	
FISHERIES / HYDROLOGY	CLASS I CROSSING FMNU	CLASS II CROSSING YES	CLASS III CROSSING NO	INTENSITY:	
OBJECTIVE / PRESCRIPTION: <i>and within Class III Channel intensity</i> <i>Alluvial Channel volume at will 130' will be 130' and</i> <i>in Class II stream flow to highly Alluvial</i> <i>area channel</i> A3 <i>channel type</i> SUP 9/ac					
WILDLIFE	IN HABITAT FOR OLD GROWTH SPECIES	NO	OBJECTIVE / PRESCRIPTION:		
See attached					
PLANNED (ORTHO PHOTO)	SCALE:				
VISUAL RECREATION	OBJECTIVE / PRESCRIPTION:	SEE ATTACHED			
REMARKS: <i>Highly Vgo = Max Vgo</i>					
CULTURAL	KNOWN SITE	PROBABILITY ZONE: HIGH — MEDIUM — OBJECTIVE / PRESCRIPTION:			
LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION: Large portion of unit appears suitable for shore yarding. Rest of unit appears can be high lead yarded				
REMARKS	RRZ 9/16/89 <i>Review 1st 1/4 mile</i>				



## 81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)

<b>VCU</b> <u>204</u> <b>EIS UNIT #</b> <u>91</u> <b>ACRES</b> <u>51</u> <b>LOGGING SYSTEM</b> _____	<b>SILVICULTURE</b> <u>Natural regeneration. Site under 12' tall with a mix of 12'-18' Douglas with a timber surplus. Retain an average of 2 trees per acre for diversity. Be concerned using the 1962 stand.</u>	<b>OBJECTIVE / PRESCRIPTION:</b> <u>Clean cut to a point for 100' b.</u>
<b>STAND #</b> _____ <b>VOLUME FEIS</b> <u>B16</u> <b>VOLUME CRUISE</b> _____	<b>ROAD LOCATION</b> <u>SD 100</u> <b>TEMPERATURE SENSITIVITY:</b> <u>YES</u> <u>NO</u> <u>NEUTRAL</u>	<b>OBJECTIVE / PRESCRIPTION:</b> <u>NO</u>
<b>SALE NAME</b> <u>AA 03 MAP# SD5</u>	<b>FISHERIES / HYDROLOGY</b> <u>CLASS I CROSSING</u> <u>CLASS II CROSSING</u> <u>CLASS III CROSSING</u>	<b>OBJECTIVE / PRESCRIPTION:</b> <u>NO</u>
<b>PHOTO LINE AND NUMBER</b> _____	<b>ROAD LOCATION</b> <u>CLOSED ROAD</u> <u>OPEN ROAD</u> <u>OBJECTIVE / PRESCRIPTION:</u> <u>Control Access</u>	<b>OBJECTIVE / PRESCRIPTION:</b> <u>NO</u>
<b>OBJECTIVES</b> <u>Provide Unimpaired Seis 90 operations</u>		
<b>PLANNED (ORTHO PHOTO)</b> <u>Scale: _____</u>		
<b>RESULTS OF MONITORING:</b>		
<b>SOILS</b> <u>HIGH HAZARD AREA</u> <u>OBJECTIVE / PRESCRIPTION:</u> <u>L7</u>		
<b>ROAD LOCATION AND OBJECTIVE</b> <u>KNOWN SITE</u> <u>PROBABILITY ZONE:</u> <u>HIGH</u> <u>MEDIUM</u> <u>OBJECTIVE / PRESCRIPTION:</u> <u>NO</u>		
<b>WILDLIFE</b> <u>IN HABITAT FOR OLD GROWTH SPECIES</u> <u>NO</u> <b>OBJECTIVE / PRESCRIPTION:</b> <u>Beaver activity noted here during past field surveys. Provide close monitoring of beaver effects near drainages. Either pull culverts or close off washouts.</u>		
<b>VISUAL RECREATION</b> <u>SEE ATTACHED</u> <b>CULTURAL</b> <u>Unit meets assigned VQO</u> <b>OBJECTIVE / PRESCRIPTION:</b> <u>NO</u>		
<b>LOGGING SYSTEM</b> <u>OBJECTIVE / PRESCRIPTION:</u> <u>NO</u>		
<b>REMARKS</b> <u>None</u>		

# 81 - 90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81 - 90 SEIS)

<b>OBJECTIONS</b> Project No. 1	<b>VICU</b> <u>204</u> <b>EIS UNIT #</b> <u>92</u> <b>ACRES</b> <u>66</u> <b>LOGGING SYSTEM</b> _____ <b>STAND #</b> _____ <b>VOLUME FEIS</b> <u>1056</u> <b>VOLUME CRUISE</b> _____ <b>SALE NAME</b> <u>AH O3 SDS</u> <b>PHOTO LINE AND NUMBER</b> _____	<b>SILVICULTURE</b> Objective / Prescription: Removal of vegetation to 10' above ground level, followed with 90% (Fanc). At ages 12-18 yrs PCT with a 4 snags per acre (for diversity). Ad timber must be felled along backline (South edge of unit). Retain topaspenes/butts	<b>OBJECTIVE / PRESCRIPTION:</b> <u>LT 1950</u>	<b>RESULTS OF MONITORING:</b> ROAD LOCATION AND OBJECTIVE: <u>Closed road</u> <u>Control access</u>	<b>OBJECTIVE / PRESCRIPTION:</b> <u>Open road</u>	<b>OBJECTIVE / PRESCRIPTION:</b> <u>Open road</u>
						
<b>PLANNED (ORTHO PHOTO)</b> Scale: _____	<b>FISHERIES / HYDROLOGY</b> <u>FHMUT</u> <b>TEMPERATURE</b> SENSITIVITY: YES <u>NO</u> <b>OBJECTIVE / PRESCRIPTION:</b> <u>Protect stream water quality</u>	<b>WILDLIFE</b> IN HABITAT FOR OLD GROWTH SPECIES <u>NO</u> <b>OBJECTIVE / PRESCRIPTION:</b> <u>See attached</u>	<b>RECREATION</b> <u>Visual</u> <b>OBJECTIVE / PRESCRIPTION:</b> <u>SEE Attached</u>	<b>CULTURAL</b> <u>Known site</u> <b>PROBABILITY ZONE:</b> HIGH <b>MEDIUM</b> <b>OBJECTIVE / PRESCRIPTION:</b> <u>Retain cultural</u>	<b>LOGGING SYSTEM</b> <b>OBJECTIVE / PRESCRIPTION:</b> <u>High grade wood</u>	<b>REMARKS</b> <u>None</u>

## 81-90 SEIS UNIT LAYOUT MITIGATION AND EFFECTIVENESS

RESOURCE GROUP	MITIGATION MEASURE	ANTICIPATED EFFECTIVENESS
SILVICULTURE		
SOILS		
ROAD LOCATION & OBJECTIVE		
FISHERIES/HYDROLOGY	1. SPLIT HARDING OR ST. RUSIAN At 20% V-WEIR. FLASH FLOW OUT W/in 48h. 2. Mainline ROAD CROSSINGS STRUCTURES High Deviation Diversions Loading CLASS II STREAM BELOW CUT + ROAD,	80% EFFECTIVE FOR CHANGED STREAMBED + WATER QUALITY, 75% EFFECTIVE FOR CHANNEL STABILITY
WILDLIFE		
VISUAL/RECREATION		
CULTURAL		
LOGGING SYSTEM		

SI - SO SEIS UNIT | AYUIT AND ROAD LOCATION CARD - PLANNED (AS PER SI - 90 SEIS)

VSI 204 EIS # * 93 ACRES 41 LOGGING SYSTEM		SILVICULTURE natural regeneration. This ranges from slow to high productivity. Site wider average 88 (Faru). Run the eastern cutting boundary along the young growth side path. Substitute timber on the lower (eastern) part of unit. Retain any stand of 2 Anaga per acre for diversity. Steep open slopes subject to 'E2' layout photo.	
STAND # VOLUME FEIS 656 VOLUME CRUISE — SALE NAME AH 03 SDS PHOTO LINE AND NUMBER		OBJECTIVE / PRESCRIPTION: Objective / PRESCRIPTION: Provide volume for the 86-90 operating period.	
RESULTS OF MONITORING: ROAD LOCATION CLOSED ROAD — AND OBJECTIVE Control Access		OBJECTIVE / PRESCRIPTION: #6 3/17/11	
PLANNED (ORTHO PHOTO)		SCALE: _____	
			
FISHERIES / HYDROLOGY		CLASS I CROSSING — CLASS II CROSSING — CLASS III CROSSING — FHMU — TEMPERATURE SENSITIVITY: YES — NO — OBJECTIVE / PRESCRIPTION: No concern identified.	
WILDLIFE		IN HABITAT FOR OLD GROWTH SPECIES Yes (see attached) The lower portion of the unit extends down into riparian habitat. Either pull culverts at the close of log (good unit size.) Design 'Save Streamside Riparian' VISUAL RECREATION - OBJECTIVE / PRESCRIPTION: Assisted up to max mod SEE ATTACHED	
CULTURAL		KNOWN SITE — PROBABILITY ZONE: HIGH — MEDIUM — OBJECTIVE / PRESCRIPTION:	
LOGGING SYSTEM		OBJECTIVE / PRESCRIPTION:	
REMARKS: See attachment			

**81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS.)**

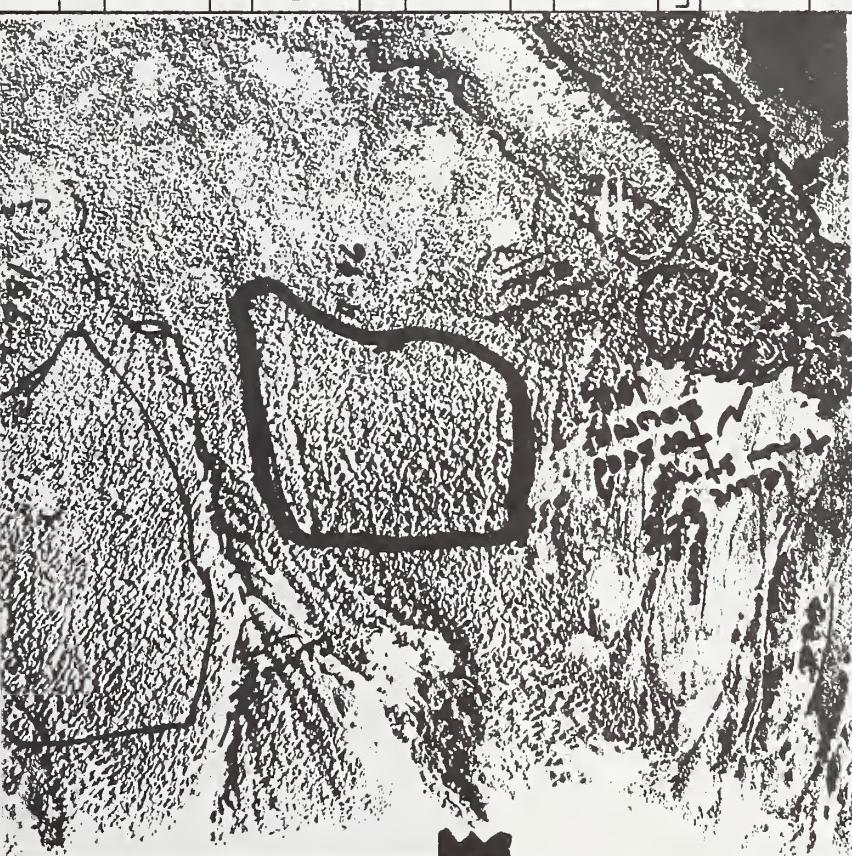
VU <u>204</u>	EIS UNIT # <u>24</u>	ACRES <u>4/0</u>	LOGGING SYSTEM <u>HL</u>	SILVICULTURE OBJECTIVE / PRESCRIPTION: Clearcut followed by natural regeneration. There is a high site (Farr 100). Precommercial thin at 12-18 yrs with a timber emphasis. Retain an ave. of 2 snags per acre for diversity.
STAND # <u>      </u>	VOLUME FEIS <u>1163</u>	VOLUME CRUISE <u>      </u>	SALE NAME <u>AA D3 SD5</u>	
PHOTO LINE AND NUMBER				SOILS HIGH HAZARD AREA — OBJECTIVE / PRESCRIPTION:  <i>See Attached</i>
<u>OBJECTIVES</u> Provide volume for the 86-90 operating period.				RESULTS OF MONITORING: ROAD LOCATION AND OBJECTIVE CLOSED ROAD — OPEN ROAD — CONTROLLED ACCESS OBJECTIVE / PRESCRIPTION:
PLANNED (ORTHO PHOTO)				WILDLIFE IN HABITAT FOR OLD GROWTH SPECIES <u>NO</u> OBJECTIVE / PRESCRIPTION:  <i>See Attached</i>
				FISHERIES / HYDROLOGY FHMU — TEMPERATURE SENSITIVITY: YES — NO — OBJECTIVE / PRESCRIPTION:  <i>No concerns identified</i>
				WILDLIFE VISUAL RECREATION UNIT SIZE OK. OBJECTIVE / PRESCRIPTION:  <i>See Attached</i>
				FISHING CULTURAL KNOWN SITE PROBABILITY ZONE : HIGH — MEDIUM — OBJECTIVE / PRESCRIPTION:
				LOGGING SYSTEM SUSPENSION, RECREATION: Sectionalized
				REMARKS



**81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)**

VOU <u>204</u>	EIS <u>95'</u>	ACRES <u>85</u>	LOGGING SYSTEM <u>H/L</u>	SILVICULTURE OBJECTIVE / PRESCRIPTION: Clearcut followed by natural regeneration. This is a medium to high risk area due to site characteristics (Farr 80-100). Inclusion of new EPL in the stand. Average Site Index is 88. Retain an average of 2 snags per ac. for diversity.
STAND <u>1</u>	VOLUME FEIS <u>2476</u>	VOLUME CRUISE <u>—</u>	SOILS HIGH HAZARD AREA	OBJECTIVE / PRESCRIPTION: <i>Soil at 1.1.1 Loc C 7/89</i>
SALE NAME <u>AA 03</u>	SD5	PHOTO LINE AND NUMBER	RESULTS OF MONITORING:	
<u>OBJECTIVES</u> Provide volume for the planned operations period.			ROAD LOCATION AND OBJECTIVE	CLOSED ROAD — OPEN ROAD —, OBJECTIVE / PRESCRIPTION: <i>Controlled access</i>
PLANNED (ORTHO PHOTO)			SCALE: _____	FISHERIES / HYDROLOGY CLASS I CROSSING <input type="checkbox"/> FHMU <input type="checkbox"/> TEMPERATURE SENSITIVITY: YES <input type="checkbox"/> NO <input type="checkbox"/>
				OBJECTIVE / PRESCRIPTION: NO CONCERN'S NOTED <i>(See attached)</i>
				WILDLIFE IN HABITAT FOR OLD GROWTH SPECIES <input type="checkbox"/> NO
				VISUAL RECREATION OBJECTIVE / PRESCRIPTION: <i>Assessable VPD = MAX VPD. Unit motto assigned VPD</i>
				CULTURAL KNOWN SITE <input type="checkbox"/> PROBABILITY ZONE: HIGH <input type="checkbox"/> MEDIUM <input type="checkbox"/>
				LOGGING SYSTEM OBJECTIVE / PRESCRIPTION: <i>Hi lead yards, locate Tamp spurs to eliminate deflection problems.</i>
				REMARKS: Recreation: See Attached

**81 - 90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81 - 90 SEIS)**

VCU <u>204</u>	EIS UNIT # <u>96</u>	ACRES <u>.53</u>	LOGGING SYSTEM <u>H/L</u>	SILVICULTURE	OBJECTIVE / PRESCRIPTION: Clearcut followed by natural regeneration. Site under range from 55 to 100 with an average of 90. Retain at age 12-18 with a timber emphasis.
STAND #	VOLUME FEIS <u>1526</u>	VOLUME CRUISE <u>—</u>			
SALE NAME <u>AA 03</u>	SDS				
PHOTO LINE AND NUMBER					
OBJECTIVES	Provide volume for the 86-90 operating period				
PLANNED (ORTHO PHOTO)	SCALE:				
RESULTS OF MONITORING:		CLOSED ROAD	OPEN ROAD	OBJECTIVE / PRESCRIPTION:	
ROAD LOCATION AND OBJECTIVE		<u>Follows the Grouse Closed</u>			
FISHERIES / HYDROLOGY	CLASS I CROSSING	CLASS II CROSSING	CLASS III CROSSING		
		FMNU	TEMPERATURE	SENSITIVITY:	YES — NO —
OBJECTIVE / PRESCRIPTION:					
No concerns noted					
WILDLIFE	IN HABITAT FOR OLD GROWTH SPECIES <u>No</u>				
OBJECTIVE / PRESCRIPTION: (See attached)					
VISUAL RECREATION	SEE ATTACHED				
ASSIGNED VPO: Modifiation Unit meets original VPO					
CULTURAL	KNOWN SITE	PROBABILITY ZONE: HIGH — MEDIUM —			
LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION: Good roads for one end				
Sustains tree.					
REMARKS <u>Kernalforn; See Attached</u>					

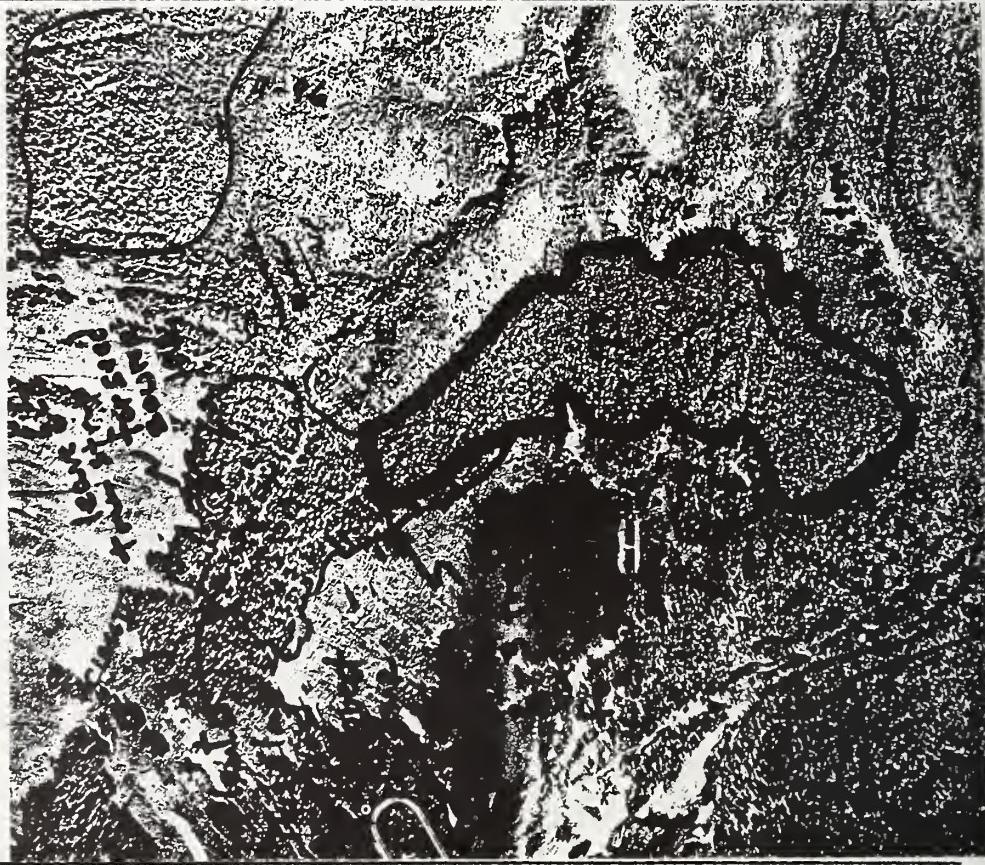
4/1/88

## 81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)

VCU <u>204</u>	EIS UNIT # <u>97</u>	ACRES <u>87</u>	LOGGING SYSTEM <u>HL</u>	SILVICULTURE	OBJECTIVE / PRESCRIPTION: Plant and regenerate old growth trees, and maintain forest health. A road to be maintained, but no access to government lands or areas below state line (about 400 ft. above海 level). Age objective is 60. Plot eastern portion of unit 400 ft. from state line (regeneration areas). Retain areas of 25% old growth and 50% second growth.
STAND # <u>—</u>	VOLUME FEIS <u>2541</u>	VOLUME CRUISE <u>—</u>	PHOTO LINE AND NUMBER <u>AA 03 SD5</u>	SOILS	HIGH HAZARD AREA <u>—</u> OBJECTIVE / PRESCRIPTION: SEE ATTACHED
<u>OBJECTIVES</u> Provide <u>U/D</u> line for the 86-90 operating period.					

RESULTS OF MONITORING:

ROAD LOCATION AND OBJECTIVE	CLOSED ROAD <u>—</u>	OPEN ROAD <u>—</u>	OBJECTIVE / PRESCRIPTION: <u>SEE ATTACHED</u>
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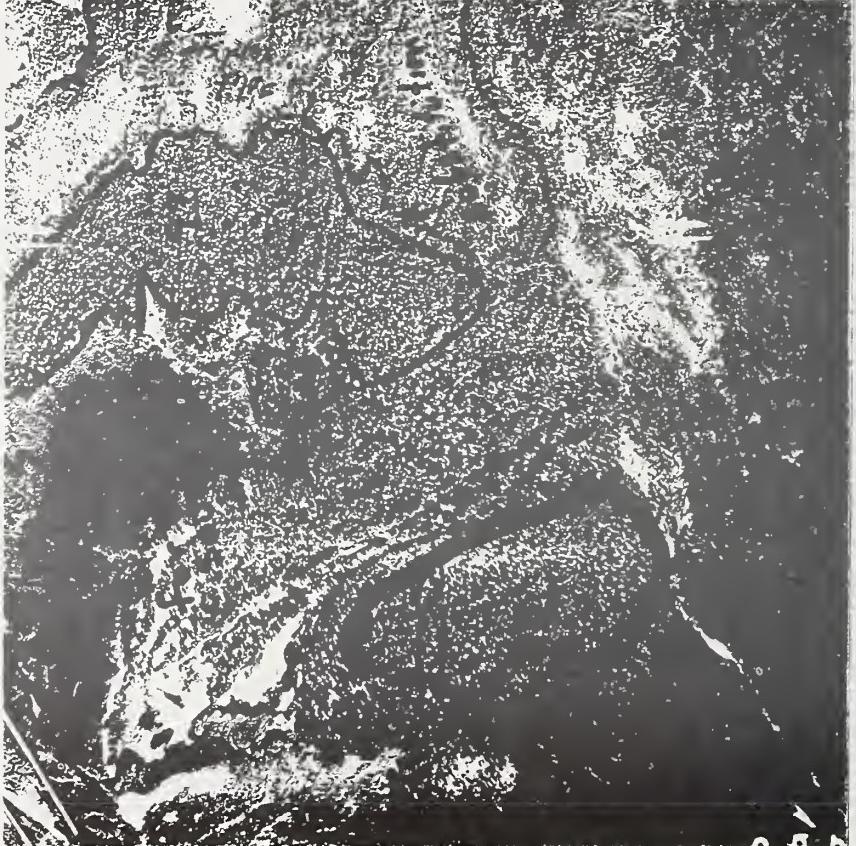
FISHERIES / HYDROLOGY	CLASS I CROSSING <u>—</u>	CLASS II CROSSING <u>—</u>	CLASS III CROSSING <u>—</u>
FHMU <u>II</u> TEMPERATURE SENSITIVITY: YES <u>—</u> NO <u>—</u>			
OBJECTIVE / PRESCRIPTION: MAINTAIN CLASS II HABITAT CAPABILITY (RESIDENT FISH) ADD GRANT TAIL WATER QUALITY BUFFER CLASS III V-NOTCH CHANNEL B3 channel type. Sip 9/12 (see attached sheet)			
WILDLIFE	IN HABITAT FOR OLD GROWTH SPECIES <u>NO</u>	OBJECTIVE / PRESCRIPTION: (See attached)	
VISUAL RECREATION	OBJECTIVE / PRESCRIPTION: <u>SEE ATTACHED</u>	Unit meets assigned VPO of Mt.	
CULTURAL	KNOWN SITE <u>—</u>	PROBABILITY ZONE: HIGH <u>—</u> MEDIUM <u>—</u>	OBJECTIVE / PRESCRIPTION: <u>SEE ATTACHED</u>
LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION: Head yard a west side of stream should be accessed with temp spur. Fill and yard away from buffer.		
REMARKS <u>None</u>			

81-90 SEIS UNIT LAYOUT MITIGATION AND EFFECTIVENESS

RESOURCE GROUP	MITIGATION MEASURE	ANTICIPATED EFFECTIVENESS
SILVICULTURE		
SOILS		
ROAD LOCATION & OBJECTIVE		
FISHERIES/HYDROLOGY	<p>① Split yard V-notch channel in East Portion of Unit. 90% effective</p> <p>② maintain 50' streamsicle buffer in SW portion of Unit. 90% effective</p>	
WILDLIFE		
VISUAL/RECREATION		
CULTURAL		
LOGGING SYSTEM		

**81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)**

VCU <u>204</u>	EIS UNIT * 98	ACRES <u>43</u>	LOGGING SYSTEM <u>H</u>	SILVICULTURE	OBJECTIVE / PRESCRIPTION: Clearcut harvest followed by natural regeneration. Site under range from 55 to 91 with an average of 80 (Fair). Retain one tree of 2 snags per acre for diversity.
STAND #	VOLUME FEIS <u>1237</u>	VOLUME CRUISE <u>—</u>	SALE NAME <u>AA 03</u>	SD5	
PHOTO LINE AND NUMBER				SOILS	HIGH HAZARD AREA
					OBJECTIVE / PRESCRIPTION: Site 4.4 ha. low
RESULTS OF MONITORING:					
ROAD LOCATION AND OBJECTIVE		CLOSED ROAD	OPEN ROAD	OBJECTIVE / PRESCRIPTION: Access to Group Closed	
PLANNED (ORTHO PHOTO)		SCALE: _____			
			FISHERIES / HYDROLOGY	CLASS I CROSSING	CLASS II CROSSING
				FHMU	SENSITIVITY: YES — NO —
			OBJECTIVE / PRESCRIPTION:	NO CONCERN'S NOTED	
				5/10 9/80	
WILDLIFE		IN HABITAT FOR OLD GROWTH SPECIES	No		
		(See attached)			
VISUAL RECREATION		OBJECTIVE / PRESCRIPTION: Site Attraction			
CULTURAL		KNOWN SITE	PROBABILITY ZONE: HIGH — MEDIUM — Assessments VPO = no PO attraction Chart meets coverage VPO		
LOGGING SYSTEM		OBJECTIVE / PRESCRIPTION: Logging; yard one end suspension.			
REMARKS		Recreation; Tree attachment			



**81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)**

VCU 204	EIS # 99	ACRES 1/2	LOGGING SYSTEM HL	SILVICULTURE	OBJECTIVE / PRESCRIPTION: Clearcut followed by artificial regeneration (Site Spurrow). This is a long term plan. Art. (Final) 100'. Shovel grading opportunity, retain area of 2 acres/yr per ac. for diversity.												
STAND #	VOLUME FEIS	245	VOLUME, CRUISE	—	—												
SALE NAME	A A 03	SDS	—	—	—												
PHOTO LINE AND NUMBER																	
OBJECTIVES	Provide volume for the 86-90 operating period.																
<p style="text-align: center;"><i>L7 1980</i></p>																	
<table border="1"> <thead> <tr> <th colspan="2">RESULTS OF MONITORING:</th> <th>CLOSED ROAD</th> <th>OPEN ROAD</th> <th colspan="2">OBJECTIVE / PRESCRIPTION:</th> </tr> </thead> <tbody> <tr> <td>ROAD LOCATION</td> <td>AND OBJECTIVE</td> <td>Control Access</td> <td>—</td> <td colspan="2">—</td> </tr> </tbody> </table>						RESULTS OF MONITORING:		CLOSED ROAD	OPEN ROAD	OBJECTIVE / PRESCRIPTION:		ROAD LOCATION	AND OBJECTIVE	Control Access	—	—	
RESULTS OF MONITORING:		CLOSED ROAD	OPEN ROAD	OBJECTIVE / PRESCRIPTION:													
ROAD LOCATION	AND OBJECTIVE	Control Access	—	—													
PLANNED (ORTHO PHOTO)	SCALE:	—	—	—	—												
FISHERIES / HYDROLOGY	CLASS I CROSSING	—	CLASS II CROSSING	—	CLASS III CROSSING												
OBJECTIVE / PRESCRIPTION:	FMHU	TEMPERATURE SENSITIVITY:	YES	NO	—												
HABITAT CAPTURE	maintain class II	and downstream fish	timber away from buffer	buffer	unrestricted fall												
C 3 channel type	—	—	—	SPR 7/89	—												
WILDLIFE	IN HABITAT FOR OLD GROWTH SPECIES	Yes	SEE ATTACHED	—	—												
VISUAL RECREATION	OBJECTIVE / PRESCRIPTION:	SEE ATTACHED	—	—	—												
ASSUMPTIONS	Vgo = max move.	—	—	—	—												
Unit needs assigned Vgo	—	—	—	—	—												
CULTURAL	KNOWN SITE	PROBABILITY ZONE:	HIGH	MEDIUM	—												
LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION:	H/lead yard. Fall and yard away from stream buffer.	—	—	—												
REMARKS	Reclamation: See attached																

81-90 SEIS UNIT LAYOUT MITIGATION AND EFFECTIVENESS

<u>RESOURCE GROUP</u>	<u>MITIGATION MEASURE</u>	<u>ANTICIPATED EFFECTIVENESS</u>
SILVICULTURE		
SOILS		
ROAD LOCATION & OBJECTIVE		
FISHERIES/HYDROLOGY	① Maintain minimum 100' streamside buffer adjacent to Class I channel.	High effectiveness
WILDLIFE		
VISUAL/RECREATION		
CULTURAL		
LOGGING SYSTEM		

**LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)**

ICU 204	EIS #/21	1860' TRP	LOGGING SYSTEM <u>the</u>	SILVICULTURE	OBJECTIVE / PRESCRIPTION: Elongated harvest followed by a thin regeneration (Sista Spruce) is a highly productive site. (Farre 100). Site also prone to slope yielding. Retain area of 2 acres per acre for diversity, if possible. This unit was felled out in 1987.
STAND #	VOLUME FEIS	—	VOLUME CRUISE	SOILS	HIGH HAZARD AREA —
SALE NAME	PHOTO LINE AND NUMBER	28B-4	OBJECTIVES	OBJECTIVE / PRESCRIPTION:	75 3/SF
RESULTS OF MONITORING:				ROAD LOCATION	
				CLOSED ROAD	OPEN ROAD
				OBJECTIVE / PRESCRIPTION:	
				FISHERIES / HYDROLOGY	
				CLASS I CROSSING <u>1</u>	CLASS II CROSSING
				FHMU <u>I</u>	CLASS III CROSSING
				TEMPERATURE SENSITIVITY: YES	NO <u>X</u>
				OBJECTIVE / PRESCRIPTION: MAINTAIN AND REINFORCE FISH CAPABILITY	
CLASS II CHANNELS.				C3 Channel Type BI Channel Type Yes (See Attached)	
IN HABITAT FOR OLD GROWTH SPECIES				WILDLIFE	
OBJECTIVE / PRESCRIPTION:				VISUAL RECREATION	
Good unit size.				OBJECTIVE / PRESCRIPTION:	
5 ac. Streamside riparian				SEE ATTACHED	
Assessments VQO = max mod				CULTURAL	
Unit meets carrying VQO				KNOWN SITE	
				PROBABILITY ZONE: HIGH — MEDIUM — LOW —	
				OBJECTIVE / PRESCRIPTION:	
LOGGING SYSTEM				OBJECTIVE / PRESCRIPTION	
Entire unit appears suitable for shovel				RR2 9/16/89	
yarding.				REMARKS Reconation. See Attachment 4	

## 81-90 SEIS UNIT LAYOUT MITIGATION AND EFFECTIVENESS

RESOURCE GROUP	MITIGATION MEASURE	ANTICIPATED EFFECTIVENESS
SILVICULTURE		
SOLIDS		
ROAD LOCATION & OBJECTIVE		
FISHERIES/HYDROLOGY	<ul style="list-style-type: none"><li>① maintain 100' Buffer Along mainstem (CS) Channel</li><li>② maintain 50' Buffer Along tributary (S1) Class I channel.</li><li>③ maintain unrestricted fish migration at S1 crossing (bridge)</li><li>④ unit has been field reviewed and riparian buffers flagged in</li></ul>	90% effective
WILDLIFE		
VISUAL/RECREATION		
CULTURAL		
LOGGING SYSTEM		

LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)

81-90 SEIS UNIT LAYOUT MITIGATION AND EFFECTIVENESS

RESOURCE GROUP	MITIGATION MEASURE	ANTICIPATED EFFECTIVENESS
SILVICULTURE		
SOILS		
ROAD LOCATION & OBJECTIVE		
FISHERIES/HYDROLOGY	① maintain 100' streamside buffer on each IT channel. Specialists have located riparian buffer on the ground.	90% Effective
WILDLIFE		
VISUAL/RECREATION		
CULTURAL		
LOGGING SYSTEM		

**81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)**

<b>OBJECTIVES</b>	EIS # <u>204</u> STAND # <u>1</u> VOLUME FEIS <u>123</u> ACRES <u>36</u> LOGGING SYSTEM <u>HL</u>			SILVICULTURE OBJECTIVE / PRESCRIPTION: Uninventoried old-growth forest stand by an elevated roadway (Sukka Spur) for timber and all log removal. There is a high risk area (Sain 94). Retain an average of 2 snags per acre for diversity. Hunt largely RBC.
	SOILS	HIGH HAZARD AREA	OBJECTIVE / PRESCRIPTION: <i>TG S/201</i>	
<b>RESULTS OF MONITORING:</b>	ROAD LOCATION AND OBJECTIVE			ROAD LOCATION CLOSED ROAD — OPEN ROAD — OBJECTIVE / PRESCRIPTION: <i>Controlled access</i>
	FISHERIES / HYDROLOGY	CLASS I CROSSING <input checked="" type="checkbox"/> CLASS II CROSSING <input type="checkbox"/> CLASS III CROSSING <input type="checkbox"/> AHMU <u>I</u> TEMPERATURE SENSITIVITY: YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	OBJECTIVE / PRESCRIPTION: <i>Maintain habitat for fish habitat management unimpeded by small timber harvests from buffer. C3B3 channel types</i>	WILDLIFE
<b>PLANNED (ORTHO PHOTO)</b>	SCALE : <u>1:250,000</u>			UNIT SIZE <u>OK</u> — VISUAL RECREATION <u>S 25 ATTACHED</u> Assisted up to max mod. Unit meets assigned VQO
	CULTURAL	KNOWN SITE <input type="checkbox"/>	PROBABILITY ZONE : HIGH <input type="checkbox"/> MEDIUM <input type="checkbox"/> LOW <input type="checkbox"/>	OBJECTIVE / PRESCRIPTION:
LOGGING SYSTEM OBJECTIVE / PRESCRIPTION <u>1/1 lead yard, fall on yard</u> away from Stream buffer,				
REMARKS <u>None, initial. See Attached.</u>				



81-90 SEIS UNIT LAYOUT MITIGATION AND EFFECTIVENESS

RESOURCE GROUP	MITIGATION MEASURE	ANTICIPATED EFFECTIVENESS
SILVICULTURE		
SOILS		
ROAD LOCATION & OBJECTIVE		
FISHERIES/HYDROLOGY	① Follow Prescriptions for Riparian Protection Zone on attached field layout form. Specialists have reviewed field layout.	90% effective
WILDLIFE		
VISUAL/RECREATION		
CULTURAL		
LOGGING SYSTEM		

# 81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)

VOL 204	EIS # 124	ACRES 129	LOGGING SYSTEM EHL	SILVICULTURE	OBJECTIVE / PRESCRIPTION:
STAND #	VOLUME FEIS	VOLUME CRUISE	SILVICULTURE OF Western Hemlock, Red Cedar, Western Red Cedar, Douglas Fir, and Western Hemlock. Recommended logging system is EHL. This unit is a great source to augment planning, just as far as options are concerned. It is located PSP afterstand (see diagram) and has a large area of old growth hemlock. It is planned to log this unit with thinning schedules. Potential problems include: 1) snow accumulation, 2) snow slides, 3) snow accumulation, 4) snow slides, 5) snow accumulation, 6) snow slides, 7) snow accumulation, 8) snow slides, 9) snow accumulation, 10) snow slides.		
SALE NAME		PHOTO LINE AND NUMBER		SOILS	OBJECTIVE / PRESCRIPTION:
OBJECTIVES				HIGH HAZARD AREA	
PLANNED (ORTHO PHOTO)		SCALE		RESULTS OF MONITORING:	
ROAD LOCATION AND OBJECTIVE		CLOSED ROAD — OPEN ROAD —		OBJECTIVE / PRESCRIPTION: Allow to Snow Closed	
WILDLIFE		CLASS I CROSSING — CLASS II CROSSING — CLASS III CROSSING —		IN HABITAT FOR OLD GROWTH SPECIES	
HYDROLOGY		FHMU	TEMPERATURE SENSITIVITY: YES NO	No. See attached objective / prescription.	
OBJECTIVE / PRESCRIPTION		NO CONCERN		It will be hard to maintain habitat diversity with such large units in Large Unit. (size somewhat mitigated by boundary configuration Past Field Recon Notes indicate the edge of this unit is a bear migration route.	
RECREATION		VISUAL OBJECTIVE / PRESCRIPTION		Unit must assigned VPO of Mod. with mitigation measures.	
CULTURAL		KNOWN SITE PROBABILITY ZONE: HIGH MEDIUM LOW		OBJECTIVE / PRESCRIPTION:	
LOGGING SYSTEM		OBJECTIVE / PRESCRIPTION		Hazard yard, fell and yard away from roads.	
REMARKS		Recreation: See Attached			

# 81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)

YOU <u>204</u>	EIS <u>125</u> * STAND *	ACRES <u>20</u>	LOGGING SYSTEM <u>HL</u>	VOLUME FEIS SALE NAME PHOTO LINE AND NUMBER
				VOLUME CRUISE
OBJECTIVES				
<p><i>Unit 5 96-90 FEIS JMAP</i></p>				
PLANNED (ORTHO PHOTO)		SCALE:		
RESULTS OF MONITORING:				
ROAD LOCATION AND OBJECTIVE		CLOSED ROAD	OPEN ROAD	OBJECTIVE / PRESCRIPTION: <i>Controlled access</i>
FISHERIES / HYDROLOGY				
CLASS I CROSSING				
CLASS II CROSSING				
CLASS III CROSSING				
FHMTTE TEMPERATURE SENSITIVITY: YES NO <input checked="" type="checkbox"/>				
OBJECTIVE / PRESCRIPTION: <i>Maintain water quality and resident fish habitat in C1455-2 stream. Maintain 50' buffer and directionally feed timber into unit.</i>				
WILDLIFE IN HABITAT FOR OLD GROWTH SPECIES <input type="checkbox"/> NO (See attached)				
VISUAL RECREATION				
OBJECTIVE / PRESCRIPTION				
<i>SEE ATTACHED</i>				
RECREATIONAL VPD = MAX VPD. <i>Unit meets assigned VPD</i>				
CULTURAL				
KNOWN SITE PROBABILITY ZONE: HIGH MEDIUM LOW				
OBJECTIVE / PRESCRIPTION				
LOGGING SYSTEM				
OBJECTIVE / PRESCRIPTION <i>Hiland yard split yard</i>				
REMARKS <i>Herbatiion scattered</i>				

SILVICULTURE  
 OBJECTIVE / PRESCRIPTION: Clearcut harvest followed by plant of Sitka Spruce. This is a Fair site index in a highly productive site. There is a few with young growth stand area appears suitable for short term grazing. Retain all mature trees for diversity. Suggest using the 100ft buffers.

SOILS  
 HIGH HAZARD AREA  
 OBJECTIVE / PRESCRIPTION:  
*F6 3/21*

OBJECTIVE / PRESCRIPTION: Clearcut harvest followed by plant of Sitka Spruce. This is a Fair site index in a highly productive site. There is a few with young growth stand area appears suitable for short term grazing. Retain all mature trees for diversity. Suggest using the 100ft buffers.

81-90 SEIS UNIT LAYOUT MITIGATION AND EFFECTIVENESS

RESOURCE GROUP	MITIGATION MEASURE	ANTICIPATED EFFECTIVENESS
SILVICULTURE		
SOILS		
ROAD LOCATION & OBJECTIVE		
FISHERIES/HYDROLOGY	① SPLIT YARD SMALL CLASS III STREAMS. SLASH CLEANOUT maintain large wood.	85% effective
WILDLIFE		
VISUAL/RECREATION		
CULTURAL		
LOGGING SYSTEM		

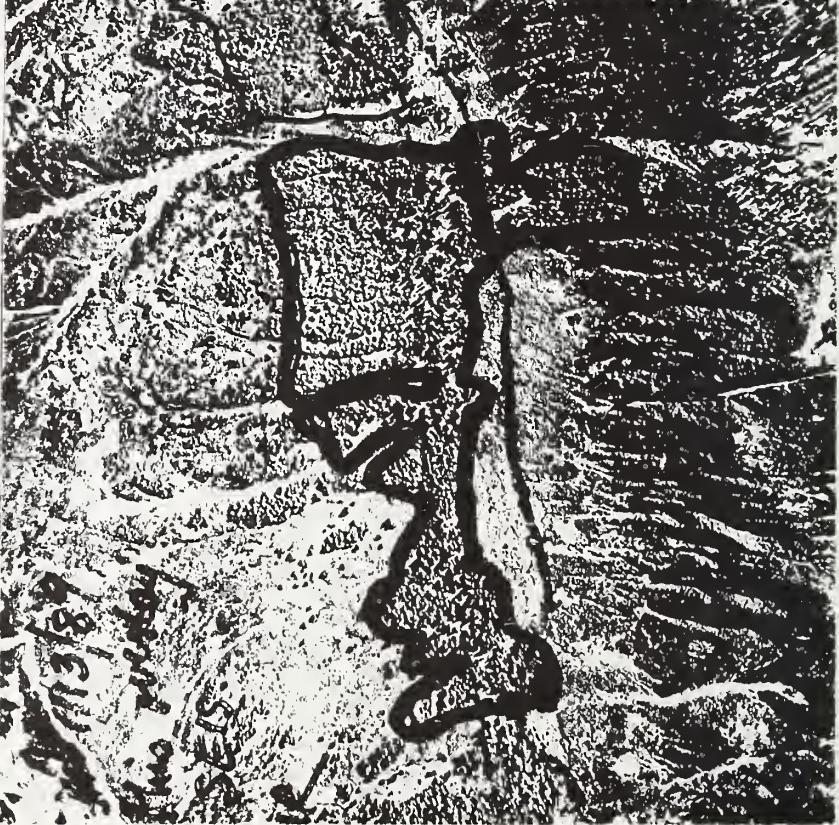
**81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)**

WU <u>204</u>	EIS <u>*133</u>	ACRES <u>118</u>	LOGGING SYSTEM <u>HL</u>	SILVICULTURE AFC 100 to 94% (spur roads) 100% (main roads). Leave 10% of trees on site (100%). Very difficult to do due to terrain. A large amount of timber can be left out. Forests should not exceed size of houses. In addition to the existing seedling measures, additional size of trees will be retained. All areas of 2 stages per acre are disturbed. Plant nurseries on potential sites of cutovers.
STAND # _____	VOLUME FEIS <u>3035</u>	VOLUME CRUISE _____	OBJECTIVE / PRESCRIPTION: <u>Retain all areas of 2 stages per acre for disturbance. Plant nurseries on potential sites of cutovers.</u>	
SALE NAME _____	PHOTO LINE AND NUMBER _____	SOILS	HIGH HAZARD AREA _____	
OBJECTIVES				
RESULTS OF MONITORING:				
ROAD LOCATION AND OBJECTIVE	CLOSED ROAD	OPEN ROAD	OBJECTIVE / PRESCRIPTION: <u>Controlled Access</u>	
PLANNED (ORTHO PHOTO)	SCALE: _____			
FISHERIES / HYDROLOGY	CLASS I CROSSING	CLASS II CROSSING	CLASS III CROSSING <u>L</u>	
FIHMU <u>II</u>	TEMPERATURE SENSITIVITY: YES <u>NO</u>			
OBJECTIVE / PRESCRIPTION: <u>Maintain Class II habitat units throughout the rotation period. Minimally impact water quality after class III streams. Retain 132/133 old growth species (See attached).</u>				
WILDLIFE	IN HABITAT FOR OLD GROWTH SPECIES <u>NO</u> (See attached) OBJECTIVE / PRESCRIPTION: Large units make it difficult to maintain habitat diversity throughout the rotation period. Large unit size - somewhat mitigated by boundary configuration.			
VISUAL RECREATION	OBJECTIVE / PRESCRIPTION: <u>SEE ATTACHED</u> Assistants VPO = MODIFICATION Unit must assign VPO			
CULTURAL	KNOWN SITE	PROBABILITY ZONE: HIGH — MEDIUM — LOW —		
LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION: <u>Head yard, split yard and yard away from stream buffer.</u>			
REMARKS: <u>Recreation; See attached</u>				

## 81-90 SEIS UNIT LAYOUT MITIGATION AND EFFECTIVENESS

<u>RESOURCE GROUP</u>	<u>MITIGATION MEASURE</u>	<u>ANTICIPATED EFFECTIVENESS</u>
SILVICULTURE		
SOILS		
ROAD LOCATION & OBJECTIVE		
FISHERIES/HYDROLOGY	<ul style="list-style-type: none"><li>① MAINTAIN 50' BUFFER STRIP ALONG CLASS II RIPARIAN ZONE. → 90% effective.</li><li>② SPLIT YATED CLASS III CHANNEL WITHIN SOUTH PORTION OF UNIT. → 90% effective.</li><li>③ REMOVE STREAM CROSSES CURRENTLY ACTIVE HABEATS TO PROTECT CHANNEL INTEGRITY. HIGH SNOW AVAILABILITY HABEATS. → 80% effective</li></ul>	
WILDLIFE		
VISUAL/RECREATION		
CULTURAL		
LOGGING SYSTEM		

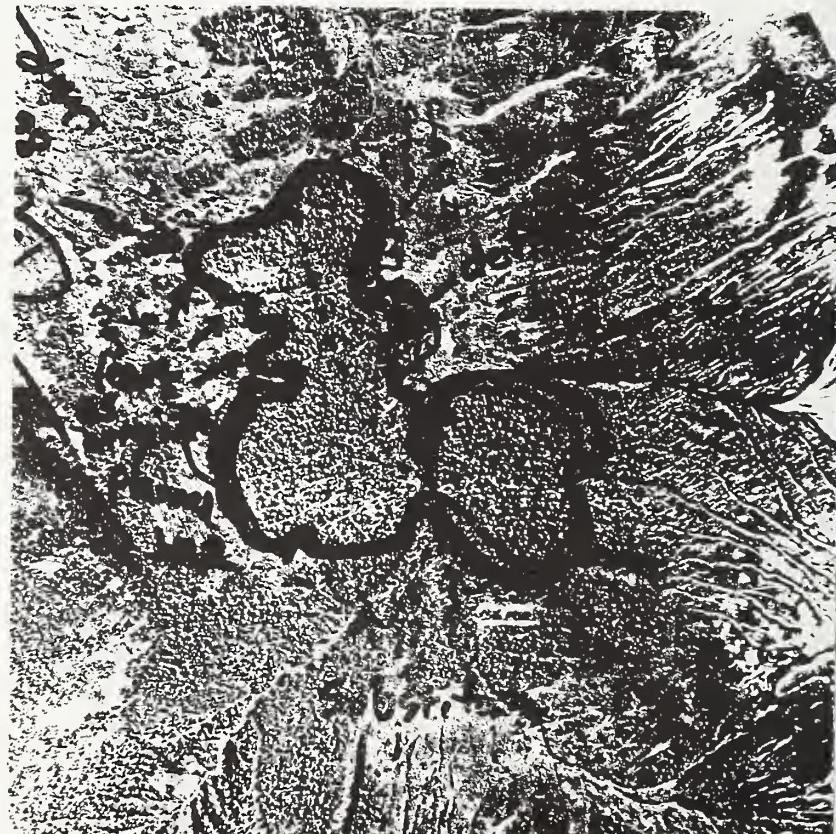
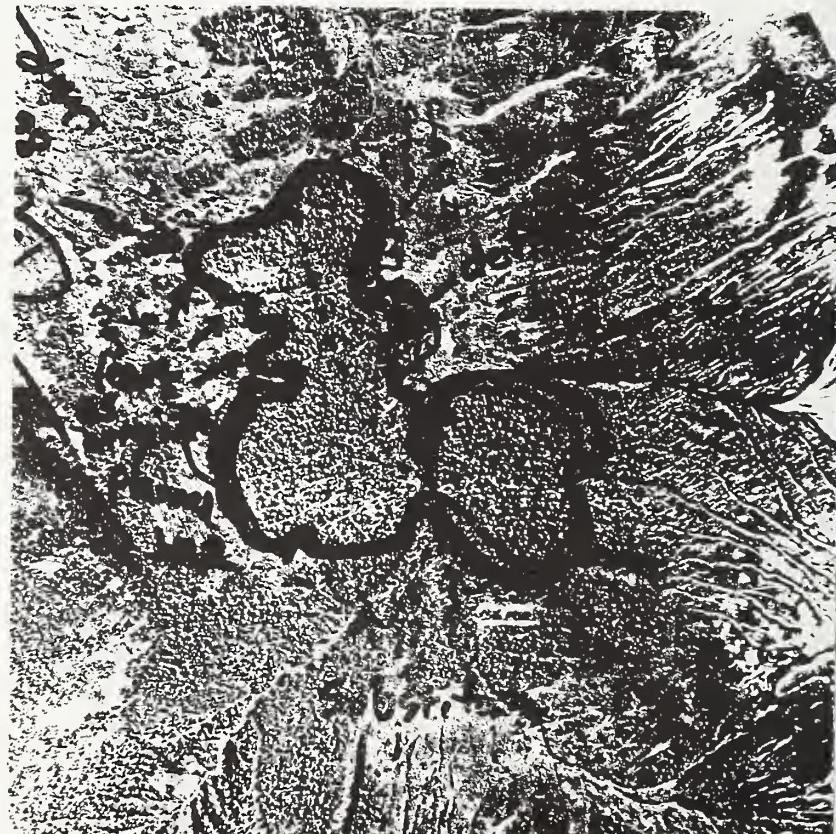
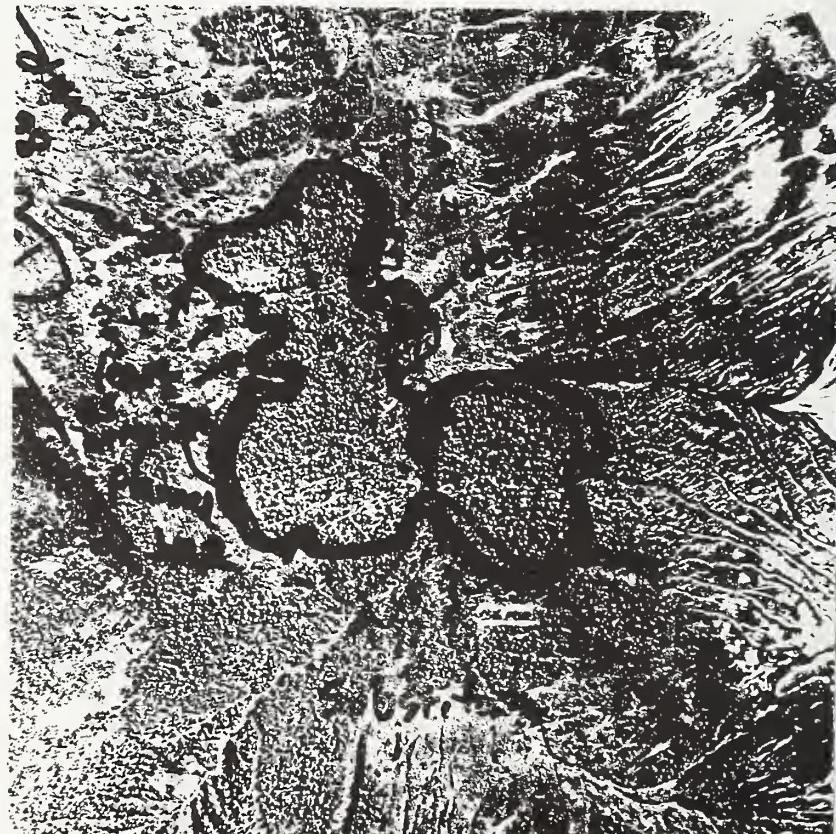
## 81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)

VCU <u>204</u>	EIS <u>*134</u>	ACRES <u>121</u>	LOGGING SYSTEM <u>HL</u>	SILVICULTURE OBJECTIVE / PRESCRIPTION: <u>Class I - followed by a timber sale.</u> <u>Aggregation (Sitka Spruce). Site changes from medium to high productivity.</u> Average site index 9'c. Very active natural regeneration. <u>Planned harvest area. Planed areas will be limited to damage. Retain all trees &gt; 2" dbh. Some old growth stands for diversity.</u> <u>Stems 10-12" dbh, open stand, and steep slopes.</u>
STAND #	VOLUME FEIS	VOLUME CRUISE		SOILS HIGH HAZARD AREA
SALE NAME				OBJECTIVE / PRESCRIPTION:
PHOTO LINE AND NUMBER				
OBJECTIVES				16 3/21
RESULTS OF MONITORING: ROAD LOCATION ROAD LOCATION AND OBJECTIVE Control Access				ROAD LOCATION CLOSED ROAD — OPEN ROAD — OBJECTIVE / PRESCRIPTION:
PLANNED (ORTHO PHOTO)				SCALE: _____
 <p>CLASS I CROSSING — CLASS II CROSSING <u>/</u> CLASS III CROSSING —  <b>FHMU II</b> TEMPERATURE SENSITIVITY: YES — NO <u>X</u>  <b>OBJECTIVE / PRESCRIPTION: MAINTAIN CLASS II RECENT FISH MIGRATION QUALITY.</b>  <u>B2 channel type.</u> 9/09 511/  <u>WILDLIFE</u> IN HABITAT FOR OLD GROWTH SPECIES <u>NO</u> See attached  <u>OBJECTIVE / PRESCRIPTION: Large units make it difficult to maintain habitat diversity throughout the rotation period.</u>  <u>Large unit size - somewhat mitigated by unit boundary configuration.</u>  <u>VISUAL RECREATION</u> OBJECTIVE / PRESCRIPTION  <u>RECREATION</u> SEE ATTACHED  <u>Logging units. Y00 = road/section</u>  <u>Unit most assigned Y00</u>  <u>CULTURAL</u> <u>KNOWN SITE</u> PROBABILITY ZONE: HIGH — MEDIUM — LOW —  <u>OBJECTIVE / PRESCRIPTION</u>    <b>LOGGING SYSTEM</b> OBJECTIVE / PRESCRIPTION <u>Hilcad yard, yard away</u>  <u>From buffer</u>    <b>REMARKS</b> <u>HCC location - see attachment d</u></p>				

81-90 SEIS UNIT LAYOUT MITIGATION AND EFFECTIVENESS

RESOURCE GROUP	MITIGATION MEASURE	ANTICIPATED EFFECTIVENESS
SILVICULTURE		
SOILS		
ROAD LOCATION & OBJECTIVE		
FISHERIES/HYDROLOGY	<ul style="list-style-type: none"> <li>① M AINTAIN 50' RIFRAZIAN BUFFER AHEAD → 90% effective</li> <li>CLASS II CHANNEL WITHIN UNIT.</li> <li>② Remove temporary stream crossing structures following harvest to protect channel integrity</li> </ul>	
WILDLIFE		
VISUAL/RECREATION		
CULTURAL		
LOGGING SYSTEM		

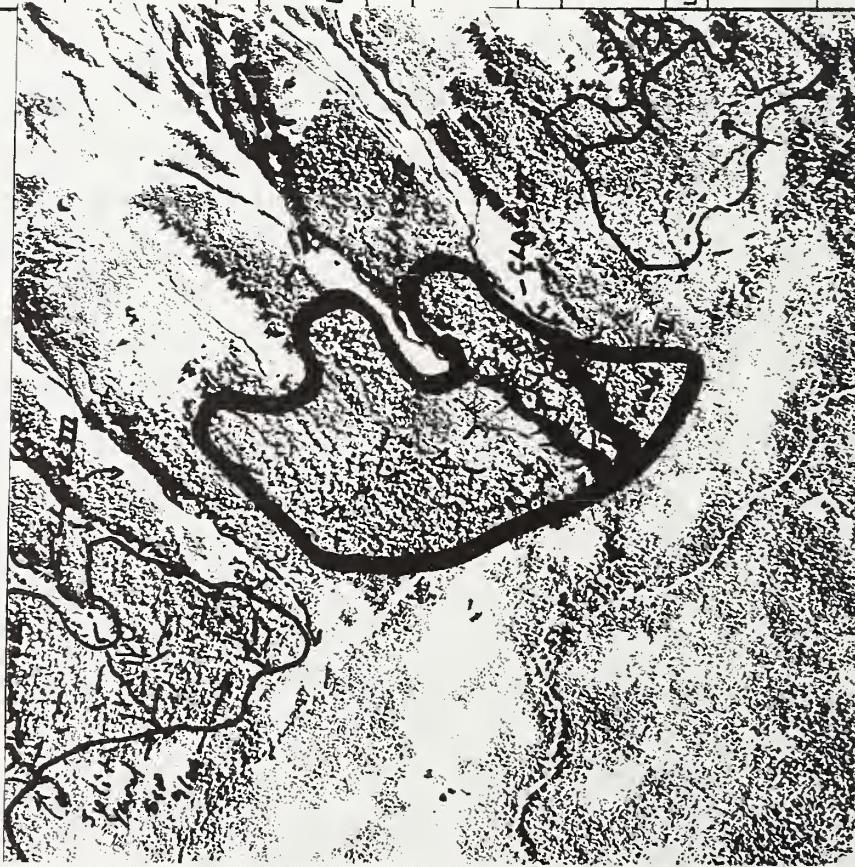
UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)

VCU	204	EIS #	135	ACRES	119	LOGGING SYSTEM	HL	SILVICULTURE Objective / Prescription: Use site and plant species suitable for the area. Plant trees other than those removed. To help prevent over-cultivation damage to soil and water quality. Retain as many old growth trees as possible.																																																																																																																																	
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SALE NAME		PHOTO LINE AND NUMBER																																																																																																																																							
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81-90 SEIS UNIT LAYOUT MITIGATION AND EFFECTIVENESS

RESOURCE GROUP	MITIGATION MEASURE	ANTICIPATED EFFECTIVENESS
SILVICULTURE		
SOILS		
ROAD LOCATION & OBJECTIVE		
FISHERIES/HYDROLOGY	<p>① <u>Maintain 50' buffer along Class II channel</u> - 95% effective.</p> <p>② <u>Install temporary bridge on stream crossing</u> to maintain channel stability.</p>	
WILDLIFE		
VISUAL/RECREATION		
CULTURAL		
LOGGING SYSTEM		

<b>(81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS))</b>			
VCU 204	EIS UNIT <u>137</u>	ACRES <u>117</u>	LOGGING SYSTEM <u>HL</u>
STAND #	VOLUME FEIS <u>2699</u>	VOLUME CRUISE <u>—</u>	
SALE NAME <u>AH 03</u>	PHOTO LINE AND NUMBER <u>30B-366</u>	OBJECTIVES Provide Volume for the 86-90 operating period.	
RESULTS OF MONITORING:			
ROAD LOCATION AND OBJECTIVE		CLOSED ROAD — OPEN ROAD —	OBJECTIVE / PRESCRIPTION: Controlled Access
PLANNED (ORTHO PHOTO)		SCALE: <u>—</u>	

This is unit on the 30B and 366 Map

SILVICULTURE	OBJECTIVE / PRESCRIPTION: Clean cut harvest followed by natural regeneration above road. Below road plant Sitka Spruce.
SOILS	Shallow grading surface below road on Slopes < 20%: This is a highly productive area. Site index is 95-100. Ave. site index is 98. Retain PFT on natural regeneration (12-18 yrs of age with胸高 diameter) to 40' diameter. Retain 2 snags per acre (on the average) to 40' diameter. Low risk young growth will be retained.
HIGH HAZARD AREA	OBJECTIVE / PRESCRIPTION:
WILDLIFE	NO Soils occur across Rd. Shovel yarding may be possible at 20% slope.
FISHERIES / HYDROLOGY	CLASS I CROSSING — CLASS II CROSSING — CLASS III CROSSING <u>2</u> FISH HABITAT TEMPERATURE SENSITIVITY: YES — NO <input checked="" type="checkbox"/>
HABITAT QUALITY	MOUNTAIN CLOUDS <input checked="" type="checkbox"/> PERSISTENT FISH QUALITY. Protect <del>class</del> stream water quality. Directionally fell timber away from buffer 50' x 90' IN HABITAT FOR OLD GROWTH SPECIES <u>NO</u> (See attached)
VISUAL RECREATION	OBJECTIVE / PRESCRIPTION: Assimilated VPO = MAX MODIFICATION Unit meets assigned VPO
CULTURAL	KNOWN SITE <input checked="" type="checkbox"/> PROBABILITY ZONE: HIGH — MEDIUM — OBJECTIVE / PRESCRIPTION:
LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION: All of unit below road and portion of unit above road appear suitable for shovel yarding. By building short spur roads, rest of unit can be Highlead Yarded.
REMARKS	RR 2 9/16/89 Recreation See Attached

## 81-90 SEIS UNIT LAYOUT MITIGATION AND EFFECTIVENESS

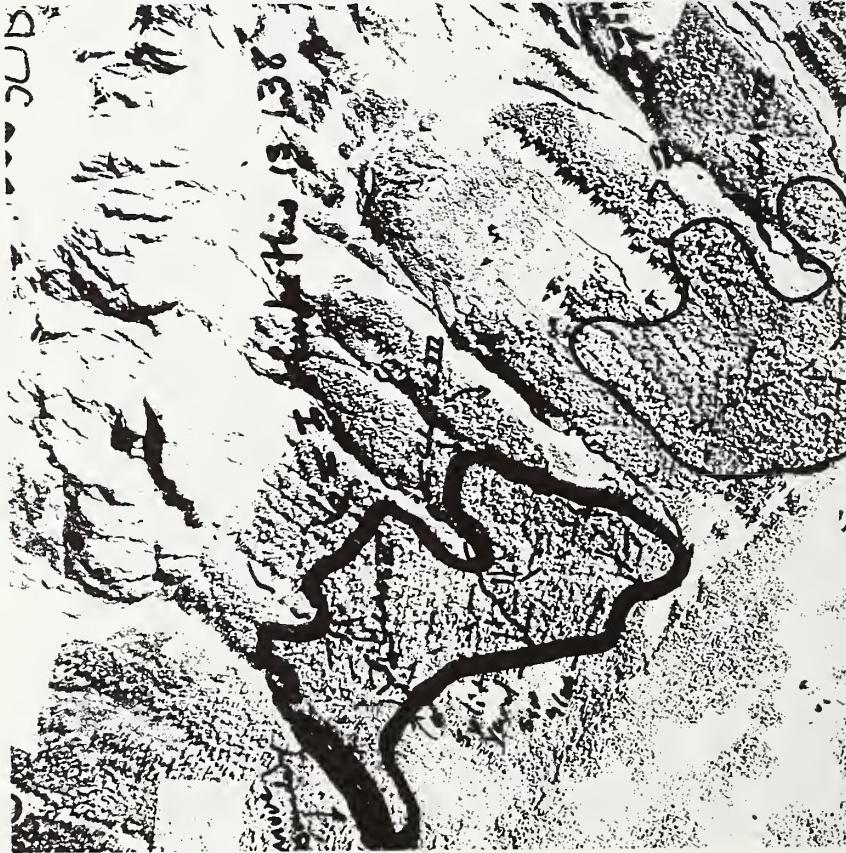
<u>RESOURCE GROUP</u>	<u>MITIGATION MEASURE</u>	<u>ANTICIPATED EFFECTIVENESS</u>
SILVICULTURE		
SOILS		
ROAD LOCATION & OBJECTIVE		
FISHERIES/HYDROLOGY	<p style="text-align: right;">✓</p> <p>① SPLIT YARD CLASS III STREAM ABOVE ROAD.</p> <p>② SPLIT YARD / DIRECTIONAL FALL w/ slash cleanup CLASS SIZE segments below road.</p> <p>③ MOUNTAIN STREAM CROSSING STRUCTURES AND LEVEL.</p>	<p>— 80% effective</p> <p>— 75% effective for habitat quality</p> <p>— 60% effective for channel stability</p>
WILDLIFE		
VISUAL/RECREATION		
CULTURAL		
LOGGING SYSTEM		

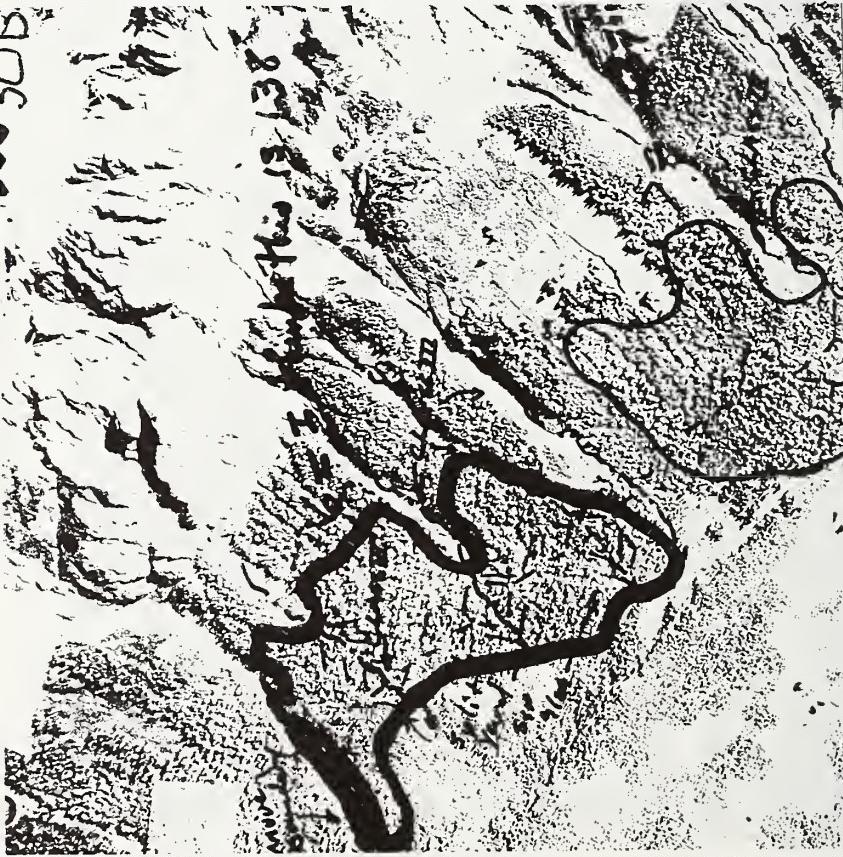
This is Unit 6 on 30B 366mp  
81-90 SEIS UNIT LAYOUT AND

AD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)

VCU	<u>204</u>	EIS UNIT	<u>138</u>	ACRES	<u>131</u>	LOGGING SYSTEM	<u>HL</u>	SILVICULTURE	OBJECTIVE / PRESCRIPTION:
STAND*	—	VOLUME FEIS	<u>3018</u>	VOLUME CRUISE	—	Area, Site index values from 83 to 100 with an average of 94 (farr), Monroe region, and PCT at ages 12-18 yrs with a timber emphasis above 100 ft dbh.	—	—	Upper portion unit. Plant all seedlings. This is about high productivity area.
SALE NAME	<u>AH</u>	SDS	—	—	—	Retain an acre of 2 snags per acre for diversity. Sweet alder for regeneration.	—	—	Monroe region.
PHOTO LINE AND NUMBER	—	30B - 366	—	—	—	—	—	—	—
OBJECTIVES	Provide volume for the 86-90 operations period.	SOILS	HIGH HAZARD AREA	—	—	—	—	—	OBJECTIVE / PRESCRIPTION:

PLANNED (ORTHO PHOTO)	SCALE:	JUL
RESULTS OF MONITORING: ROAD LOCATION AND OBJECTIVE	CLOSED ROAD — OPEN ROAD — OBJECTIVE / PRESCRIPTION:  Controlled Access	
FISHERIES / HYDROLOGY OBJECTIVE / PRESCRIPTION:  AND PROTECT WATER QUALITY	CLASS I CROSSING — CLASS II CROSSING — FHNU <del>III</del> TEMPERATURE SENSITIVITY: YES — NO CLASS III channel intensity	CLASS III CROSSING — NO (See attached)
WILDLIFE OBJECTIVE / PRESCRIPTION:  A3 channel types	IN HABITAT FOR OLD GROWTH SPECIES	SRP 916189
VISUAL RECREATION OBJECTIVE / PRESCRIPTION:  SEE ATTACHED	Large unit size will make it difficult to maintain habitat diversity throughout the rotation period.	
CULTURAL KNOWN SITE OBJECTIVE / PRESCRIPTION:  Unit meets assigned VPO	ASSIGNED VPO = MAX HOLD.	PROBABILITY ZONE : HIGH — MEDIUM —
LOGGING SYSTEM OBJECTIVE / PRESCRIPTION: All of unit below road and portions of unit above road appear suitable for shale yarding. Rest of unit can be high lead yarded. Split settings and yard away from class III streams in unit.		RZ 916189
REMARKS See Attach L		

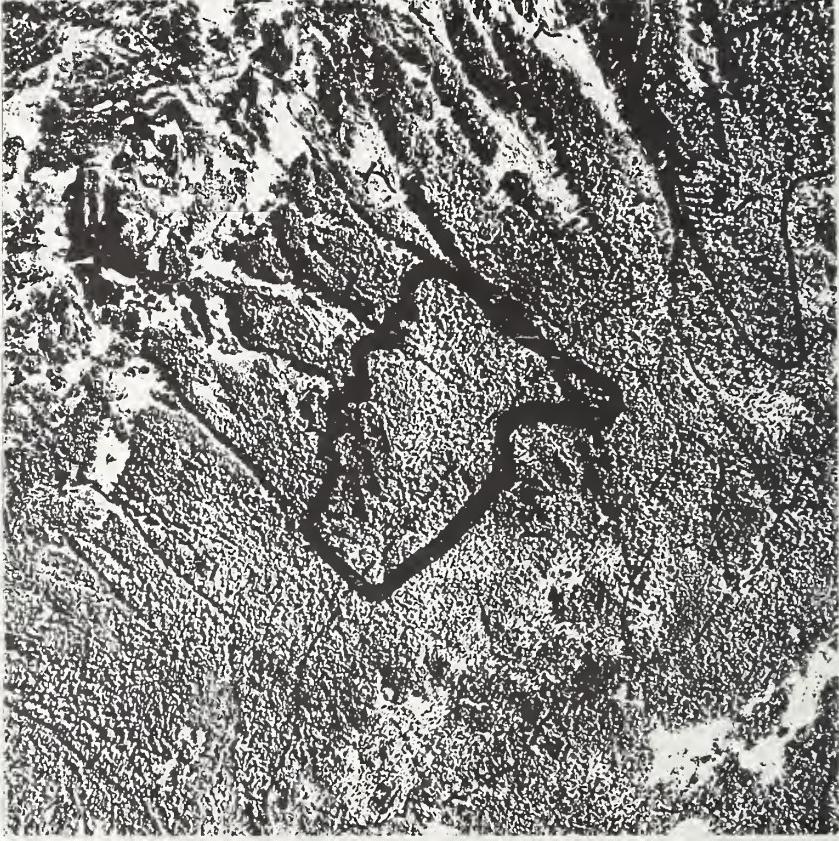




## 81-90 SEIS UNIT LAYOUT MITIGATION AND EFFECTIVENESS

RESOURCE GROUP	MITIGATION MEASURE	ANTICIPATED EFFECTIVENESS
SILVICULTURE		
SOILS		
ROAD LOCATION & OBJECTIVE		
FISHERIES/HYDROLOGY	<ul style="list-style-type: none"><li>① Split yard class III streams → 80% effective.</li><li>② Maintain stream crossing structures annually. Very high bedload of snow avalanche debris loading.</li><li>③ Monitor effectiveness of crossing design.</li></ul>	60% effective for channel stability.
WILDLIFE		
VISUAL/RECREATION		
CULTURAL		
LOGGING SYSTEM		

**81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS.)**

ROW <u>204</u>	EIS UNIT # <u>135</u>	ACRES <u>69</u>	LOGGING SYSTEM <u>H/L</u>	SILVICULTURE OBJECTIVE / PRESCRIPTION: Clear cut following with natural regen. Young 9 year old in center of stand 15' (low risk). Trees at a high site older area showing 90% live per at age 12-18 yrs with a timber emphasis. Retain all over, of 2 snags plus a w. for diversity.
STAND #	VOLUME FEIS	<u>1104</u>	VOLUME CRUISE —	
SALE NAME <u>AB D3</u>	PHOTO LINE AND NUMBER <u>SD5</u>			
<b>OBJECTIVES</b> Provide volume for the 86-90 operating period.				SOILS HIGH HAZARD AREA — OBJECTIVE / PRESCRIPTION:  NO soils concern about for d during photo review Kew 9/89
RESULTS OF MONITORING: ROAD LOCATION AND OBJECTIVE				CLOSED ROAD — OPEN ROAD — OBJECTIVE / PRESCRIPTION: Controlled access
				FISHERIES / HYDROLOGY CLASS I CROSSING — CLASS II CROSSING — CLASS III CROSSING — FHMU <u>3</u> TEMPERATURE SENSITIVITY: YES — NO <u>X</u> OBJECTIVE / PRESCRIPTION: Protect class II streams water quality move boundary away from 2 V-North, class III, and Protected critical, class I. DIC 9/16/89
				WILDLIFE IN HABITAT FOR OLD GROWTH SPECIES <u>NO</u> <u>See attached</u> OBJECTIVE / PRESCRIPTION:
PLANNED (ORTHO PHOTO)				SCALE: _____
				
				VISUAL RECREATION OBJECTIVE / PRESCRIPTION:  <u>SEE ATTACHED</u> Assessor VPO = Max word Unit meets assigned VPO
				CULTURAL KNOWN SITE — PROBABILITY ZONE: HIGH — MEDIUM — OBJECTIVE / PRESCRIPTION:
LOGGING SYSTEM				OBJECTIVE / PRESCRIPTION: Hi end yard, fell end yard away from stream buffers
				REMARKS <u>Location: See Attached</u>

## 81-90 SEIS UNIT LAYOUT MITIGATION AND EFFECTIVENESS

RESOURCE GROUP	MITIGATION MEASURE	ANTICIPATED EFFECTIVENESS	
		SOILS	WILDLIFE
SILVICULTURE			
SOILS			
ROAD LOCATION & OBJECTIVE			
FISHERIES/HYDROLOGY	1. CLASS III WATER QUALITY, ROLL FOUNDATION RATE 20% 2. ROLL FOUNDATION AND RIVER FORTIFIED CHANNEL. 3. R.R. CROSSING, MAINTAIN RAILROAD ALIGNMENT.	80% EFFECTIVE TO PROTECT CHANNEL STABILITY + WATER QUALITY.	
WILDLIFE			
VISUAL/RECREATION			
CULTURAL			
LOGGING SYSTEM			

**81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)**

VCU <u>204</u>	EIS UNIT # <u>140</u>	ACRES <u>90</u>	LOGGING SYSTEM <u>H.L.</u>	SILVICULTURE Regen on Sides of road. 10a ac/ha, area patient to Sifka Spruce. Shrub layering opportunity on slopes c 20% Ave. site index 90 (Farr). PCT on natural regen. Area at 90% 12-18 yrs with a thinning component. Retain tree av. of 29-30 yrs per acre diversify.	OBJECTIVE / PRESCRIPTION: Regen on Sides of road. 10a ac/ha, area patient to Sifka Spruce. Shrub layering opportunity on slopes c 20% Ave. site index 90 (Farr). PCT on natural regen. Area at 90% 12-18 yrs with a thinning component. Retain tree av. of 29-30 yrs per acre diversify.
STAND # <u>AA 03</u>	VOLUME FEIS <u>440</u>	VOLUME CRUISE <u>SD5</u>			
SALE NAME <u>PHOTO LINE AND NUMBER</u>					
<b>OBJECTIVES</b> Provide Volume for the 86-90 operating Period.				SOILS HIGH HAZARD AREA	OBJECTIVE / PRESCRIPTION: SLanted 10% on 1/2 of the area. 10% on 1/2 of the area. 10% on 1/2 of the area.
				RESULTS OF MONITORING: ROAD LOCATION AND OBJECTIVE	CLOSED ROAD — OPEN ROAD — OBJECTIVE / PRESCRIPTION: CLOSED ROAD — OPEN ROAD — OBJECTIVE / PRESCRIPTION: <b>Controlled Access</b>
				FISHERIES / HYDROLOGY	CLASS I CROSSING <u>2</u> CLASS II CROSSING <u>—</u> CLASS III CROSSING <u>—</u> FHMU <u>I</u> TEMPERATURE SENSITIVITY: YES — NO —
				WILDLIFE	OBJECTIVE / PRESCRIPTION: MAINTAIN AND PROMOTE CLASS II STREAMS. Directionally pull timber into unit. TWO CLASS II STREAMS. C13, B1 Channel types 9/69 SP (scratchesheet) IN HABITAT FOR OLD GROWTH SPECIES Yes. (See attached)
				10 ac. Streamside Riparian	Large unit size will make difficult to maintain habitat diversity throughout the rotation period.
				VISUAL RECREATION	OBJECTIVE / PRESCRIPTION: SEE ATTACHED
				CULTURAL	Assist others VQO = MAX MOD Unit meets assigned VQO KNOWN SITE <u>—</u> PROBABILITY ZONE: HIGH — MEDIUM — OBJECTIVE / PRESCRIPTION:
				LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION: Unit of 40 ha seems to be suitable for should ground on 20% slopes. Hiland best.
				REMARKS	Recreation! See Attached J

## 81-90 SEIS UNIT LAYOUT MITIGATION AND EFFECTIVENESS

RESOURCE GROUP	MITIGATION MEASURE	ANTICIPATED EFFECTIVENESS
SILVICULTURE		
SOILS		
ROAD LOCATION & OBJECTIVE		
FISHERIES/HYDROLOGY	<ul style="list-style-type: none"><li>① MAINTAIN minimum 100' stream buffer - 90% effective along main stem class II.</li><li>② MAINTAIN 50 ft stream-side buffer along south boundary with Class I tributary.</li></ul>	
WILDLIFE		
VISUAL/RECREATION		
CULTURAL		
LOGGING SYSTEM		

**81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS.)**

YCU 204 EIS UNIT # 141	ACRES 76	LOGGING SYSTEM FL	SILVICULTURE	OBJECTIVE / PRESCRIPTION: Encountered habitat followed by anticipated regeneration (5, 10, 15, 20 years). Shovel grading is appropriate on this unit. Retain an average of 2 stumps per acre for diversity (if possible).
STAND #	VOLUME FEIS 2653	VOLUME CRUISE —		
SALE NAME AA 03	SDS			
PHOTO LINE AND NUMBER				
OBJECTIVES Provide volume for the 86-90 operating period		SOILS HIGH HAZARD AREA — OBJECTIVE / PRESCRIPTION: Several yearling opportunities available if wegele classification P(w) 9/87		
RESULTS OF MONITORING:		SOILS HIGH HAZARD AREA — OBJECTIVE / PRESCRIPTION: Closed road — OPEN ROAD — OBJECTIVE / PRESCRIPTION: if wegele classification P(w) 9/87		
PLANNED (ORTHO PHOTO)		SCALE: —	ROAD LOCATION AND OBJECTIVE	ROAD LOCATION CLOSED ROAD — OPEN ROAD — OBJECTIVE / PRESCRIPTION: Controlled Access
				
FISHERIES / HYDROLOGY	CLASS I CROSSING <input checked="" type="checkbox"/>	CLASS II CROSSING <input type="checkbox"/>	CLASS III CROSSING <input type="checkbox"/>	
FMNU	TEMPERATURE SENSITIVITY: YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>		
OBJECTIVE / PRESCRIPTION: maintain Class II and downstream fish habitat capability. Consider downstream harvest in north portion of unit to protect small rearing channels.				
WILDLIFE	B1, C3 channel types IN HABITAT FOR OLD GROWTH SPECIES Yes (see attached)			
The northern portion of the unit lies within riparian habitat. Retain snags in small clumps in the northern portion of the unit. 5ac. Riparian Habitat				
VISUAL RECREATION	OBJECTIVE / PRESCRIPTION: SEE ATTACHED			
Assessments 196 = MAX mob. Unit route assigned VQO				
CULTURAL	KNOWN SITE <input type="checkbox"/> PROBABILITY ZONE: HIGH — MEDIUM — OBJECTIVE / PRESCRIPTION:			
LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION: Unit appears to be suitable for shovel grading.			
REMARKS Per-cation: See Attached				

## 81-90 SEIS UNIT LAYOUT MITIGATION AND EFFECTIVENESS

RESOURCE GROUP	MITIGATION MEASURE	ANTICIPATED EFFECTIVENESS
SILVICULTURE		
SOILS		
ROAD LOCATION & OBJECTIVE		
FISHERIES/HYDROLOGY	<p>① MAINTAIN 100' BUFFER ALONG MAIN STREAM CLASS I STREAMS.</p> <p>② DIRECTIONAL FALL, SPLIT YARD, SLASH CLEANSUP ON SMALL REARING CHANNELS (CLASS II STREAMS)</p>	<p>→ 70% effective.</p> <p>→ 75% effective.</p>
WILDLIFE		
VISUAL/RECREATION		
CULTURAL		
LOGGING SYSTEM		

### **SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)**

VCU 204 EIS UNIT \*142 ACRES 71 LOGGING SYSTEM H  
 STAND \*1 VOLUME FEIS 2300 VOLUME CRUISE —  
 SALE NAME AA 03 SDS

**OBJECTIVES** Provide volume for the 86-90 operating

Period.

**SILVICULTURE** OBJECTIVE / PRESCRIPTION: Silviculture and agroforestry  
regen on alluvial area (5334 ha forest unit). It started regen on other soil accounts. This is a medium to highly regeneration site. Average site under 50%. Pct 70 natural regen. and as will function principally at 12-18 yrs of age. Retain an average of 2 trees per ac. for diversity.

## OBJECTIVE / PRESCRIPTION :

S.A.

POLAROID PHOTO

**RESULTS OF MONITORING:**  
ROAD LOCATION      CLOSED ROAD — OPEN ROAD —  
AND OBJECTIVE      OBJECTIVE / PRESCRIPTION:  
**Control Access**

81-90 SEIS UNIT LAYOUT MITIGATION AND EFFECTIVENESS

RESOURCE GROUP	MITIGATION MEASURE	ANTICIPATED EFFECTIVENESS
SILVICULTURE		
SOILS		
ROAD LOCATION & OBJECTIVE		
FISHERIES/HYDROLOGY	Maintain minimum 100' streamside Buffer along 6 river stretch channels.	90% effective
WILDLIFE		
VISUAL/RECREATION		
CULTURAL		
LOGGING SYSTEM		

Two site unit 8 on 30B 366 Imp  
81-90 EIS UNIT →  
 VOU 204 EIS UNIT 143 ACRES 49 LOGGING SYSTEM HL  
 STAND # VOLUME FEIS 879 VOLUME CRUISE —  
 SALE NAME AH 03 SD 5  
 PHOTO LINE AND NUMBER 30B - 366  
OBJECTIVES Provide volume for the 86-90 operating period.

EIS UNIT		LOGGING SYSTEM		SILVICULTURE		OBJECTIVE / PRESCRIPTION: Clearcut harvest followed by natural regeneration. This is a high productivity area (Farr 100) low risk young-growth in center of stand. Monitor regen. & ACT at ages 12-18 with timber emphasis. Retain an area of 2 stands per acre for diversity.		Wetland Bottomland Soil	
VOU	204	EIS UNIT	143	ACRES	49	VOLUME FEIS	879	VOLUME CRUISE	—
SALE NAME	AH 03	PHOTO LINE AND NUMBER	30B - 366						
<u>OBJECTIVES</u> Provide volume for the 86-90 operating period.				SOILS		HIGH HAZARD AREA		OBJECTIVE / PRESCRIPTION:	
				No Soils concerns				EW 9/84	
RESULTS OF MONITORING:									
ROAD LOCATION AND OBJECTIVE		CLOSED ROAD — OPEN ROAD —		OBJECTIVE / PRESCRIPTION:		Controlled Access			
PLANNED (ORTHO PHOTO)		SCALE:		FISHERIES / HYDROLOGY		CLASS I CROSSING — CLASS II CROSSING — CLASS III CROSSING — FHMU — TEMPERATURE SENSITIVITY: YES — NO —		OBJECTIVE / PRESCRIPTION:	
				NO CONCERN		TAD 7/87			
WILDLIFE		IN HABITAT FOR OLD GROWTH SPECIES		NO (See attached)					
VISUAL RECREATION		OBJECTIVE / PRESCRIPTION:		Attached					
				Assessments 190 = 19 Ax road. Unit meets assigned VPD					
CULTURAL		KNOWN SITE		PROBABILITY ZONE: HIGH — MEDIUM —		OBJECTIVE / PRESCRIPTION:			
LOGGING SYSTEM		OBJECTIVE / PRESCRIPTION:		High lead yard. Move spur road closer to center of unit in order to obtain reach for logging		RPA 9/16/89			
REMARKS								Potential for an old growth stand - TADP —	



Shown as unit 9 on 30B 366  
 81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)

VCU	<u>204</u>	EIS	<u>* 157</u>	ACRES	<u>37 ✓</u>	LOGGING SYSTEM	<u>Logging</u>	SILVICULTURE	OBJECTIVE / PRESCRIPTION: Clear cut followed by artificial regeneration in portion of unit in blue ink on photo.
STAND *		VOLUME FEIS	<u>1199</u>	VOLUME CRUISE	—				Use select on system or portion of unit highlighted on photo - older & fresh.
SALE NAME	<u>AA 03</u>								Plant clearcut area to Sitka spruce. Shovel yarding is appropriate in this unit. Keep distance of mineral soil to a minimum. This area is rare low site index.
PHOTO LINE AND NUMBER	<u>30B-366</u>								Retain an ave. of 2 stands in place for diversity. Suggest using 32' repeat boundary.
OBJECTIVES	Provide volume for the 86-90 operating period							SOILS	OBJECTIVE / PRESCRIPTION: HIGH HAZARD AREA

PLANNED (ORTHO PHOTO)	SCALE:	ROAD LOCATION AND OBJECTIVE	RESULTS OF MONITORING:	OBJECTIVE / PRESCRIPTION:
		CLOSED ROAD — OPEN ROAD — Controlled Access		
FISHERIES / HYDROLOGY	CLASS I CROSSING <u>✓</u>	CLASS II CROSSING <u>✓</u>	CLASS III CROSSING <u>—</u>	OBJECTIVE / PRESCRIPTION: NO
		AMNU <u>✓</u>	TEMPERATURE SENSITIVITY: YES <u>—</u>	
		OBJECTIVE / PRESCRIPTION: MAINTAIN CLASS II WADEROMON'S FISH AND WATER QUALITY. Directionally fall timber away from 160' buffer		
		81 CHANNEL TYPE		
WILDLIFE	IN HABITAT FOR OLD GROWTH SPECIES <u>Yes</u>	OBJECTIVE / PRESCRIPTION: <u>See attached</u>		
		Good unit size for mgmt. of riparian habitat. 10 ac. streamside riparian		
VISUAL RECREATION	OBJECTIVE / PRESCRIPTION: SEE ATTACHED			
		Assessments VPO = max mod Unit meets original VPO		
CULTURAL	KNOWN SITE <u>✓</u>	PROBABILITY ZONE: HIGH <u>—</u>	MEDIUM <u>—</u>	OBJECTIVE / PRESCRIPTION:
LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION: Entire unit appears suitable for shovel yarding.			
REMARKS	RRZ 9/16/89 Recreation: See Attached			



## 81-90 SEIS UNIT LAYOUT MITIGATION AND EFFECTIVENESS

RESOURCE GROUP	MITIGATION MEASURE	ANTICIPATED EFFECTIVENESS
SILVICULTURE		
SOILS		
ROAD LOCATION & OBJECTIVE		
FISHERIES/HYDROLOGY	<ul style="list-style-type: none"><li>- Pull cultural</li><li>- tree trapping</li><li>- Species protection to management regime</li></ul>	
WILDLIFE		
VISUAL/RECREATION		
CULTURAL		
LOGGING SYSTEM		

**81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS.)**

VCU <u>204</u>	EIS # <u>*197</u>	ACRES <u>62</u>	LOGGING SYSTEM <u>Shovel</u>	SILVICULTURE <u>Seedling</u>	OBJECTIVE / PRESCRIPTION: Clear cut the northern portion of the stand and use selection system on southern portion.	
STAND # <u>AA</u>	VOLUME FEIS <u>1395</u>	VOLUME CRUISE <u>SDS</u>	SALE NAME <u>AA D3</u>	PHOTO LINE AND NUMBER <u>_____</u>	Should yielding of the greatest portion is acceptable. Northern portion is even aged stand with scattered individuals. Southern portion borders Game Creek is more odd growth dominated spruce. This is a highly productive area (FST 100). Plant clearcut portion of unit with Spruce. Red and 2 sugar pine acre in cleared portion if possible for diversity. Use layout by Chalk Blanks.	
<b>OBJECTIVES</b> Provide volume for the 86-90 operating period.				HIGH HAZARD AREA <u>_____</u>	OBJECTIVE / PRESCRIPTION:	
				<i>LTS</i>		
PLANNED (ORTHO PHOTO)		SCALE: <u>_____</u>	ROAD LOCATION AND OBJECTIVE	RESULTS OF MONITORING:	CLOSED ROAD	OPEN ROAD
			<u>Controlled Access</u>			
				FISHERIES / HYDROLOGY	CLASS I CROSSING <u>1</u>	CLASS II CROSSING —
					AMAU <u>_____</u>	TEMPERATURE SENSITIVITY: YES <u>NO</u>
				OBJECTIVE / PRESCRIPTION: <u>Minimize Class II crossings</u>		<u>FISH CAPTUREABILITY</u> : Minimal fall timber away from 100' buffer.
				WILDLIFE	IN HABITAT FOR OLD GROWTH SPECIES <u>Yes</u> (see attached)	OBJECTIVE / PRESCRIPTION:
					This is a Fair sized unit in Riparian habitat. Unit boundary configuration will somewhat mitigate its size.	
				CULTURAL	KNOWN SITE <u>_____</u>	PROBABILITY ZONE: HIGH — MEDIUM —
				RECREATION	OBJECTIVE / PRESCRIPTION:	
					SEE ATTACHED	
					ASSIGNED UPO = MAX MOD.	
					(Unit) meets assigned UPO	
				LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION:	
					Unit appears suitable for shared yarding	
				REMARKS	REMARKS: See attached	
					RRZ	9/16/89

81-90 SEIS UNIT LAYOUT MITIGATION AND EFFECTIVENESS

RESOURCE GROUP	MITIGATION MEASURE	ANTICIPATED EFFECTIVENESS
SILVICULTURE		
SOILS		
ROAD LOCATION & OBJECTIVE		
FISHERIES/HYDROLOGY	② maintain 100' buffer along mainstem (C3) class II channel.	<u>90% effective</u>
WILDLIFE		
VISUAL/RECREATION		
CULTURAL		
LOGGING SYSTEM		

This is unit #8 (81-86) JMR

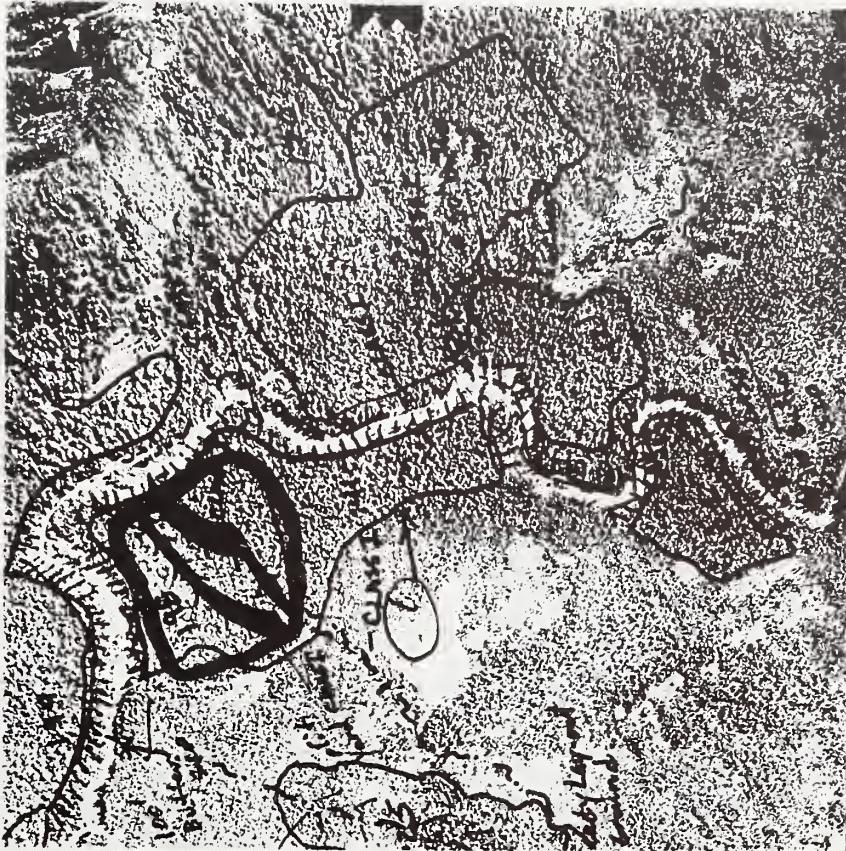
### 81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)

YU 204	EIS #	198 ACRES	LOGGING SYSTEM	SILVICULTURE	OBJECTIVE / PRESCRIPTION: Clear-cut harvest followed by fast regeneration (S+ta spruce). This is a highly productive site (Farr 100). Shrub yarding is appropriate on this unit. Retain an area of 2 acres per acre (if possible) for diversity. Suggest using layout as done by Chuck Hinkle.
STAND #	VOLUME FEIS	245	VOLUME CRUISE		
SALE NAME	DA 03	SDS			
PHOTO LINE AND NUMBER			HIGH HAZARD AREA		OBJECTIVE / PRESCRIPTION:

OBJECTIVES Provide Volume for the 86-90 operating period

See Sale Prep. Summary

PLANNED (ORTHO PHOTO)	SCALE:	RESULTS OF MONITORING: ROAD LOCATION AND OBJECTIVE	CLOSED ROAD — OPEN ROAD —	OBJECTIVE / PRESCRIPTION: Controlled Access
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FISHERIES / HYDROLOGY	CLASS I CROSSING	CLASS II CROSSING	CLASS III CROSSING
FRHMU	<input checked="" type="checkbox"/>	TEMPERATURE SENSITIVITY: YES	NO <input checked="" type="checkbox"/>
OBJECTIVE / PRESCRIPTION: MAINTAIN CLASS I AND ORDINANCES F-S-A PROTECT CROWN GIANT CONSIDER SELECTING UNIT TO C3, B1 CHANNEL/TYPES 9/09 SEP			
WILDLIFE	IN HABITAT FOR OLD GROWTH SPECIES	YES	SEE ATTACHED
OBJECTIVE / PRESCRIPTION:	This is a good sized unit for riparian habitats. If all the proposed units adjacent to this one were cut at the same time, Riverbank would be and adverse affect on habitat diversity.		
RECREATION	VISUAL	OBJECTIVE / PRESCRIPTION:	SEE ATTACHED

CULTURAL	KNOWN SITE	PROBABILITY ZONE: HIGH — MEDIUM —
OBJECTIVE / PRESCRIPTION:	Entire unit appears suitable for shovel yarding	

LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION:	Entire unit appears suitable for shovel yarding
REMARKS	REMARKS	JRC-Location: See Attached

RR2 9/16/89

JRC-Location: See Attached

81-90 SEIS UNIT LAYOUT MITIGATION AND EFFECTIVENESS

RESOURCE GROUP	MITIGATION MEASURE	ANTICIPATED EFFECTIVENESS
SILVICULTURE		
SOILS		
ROAD LOCATION & OBJECTIVE		
FISHERIES/HYDROLOGY	<ul style="list-style-type: none"> <li>① Maintain 100' buffer adjacent to main Class II stream. - 90% effective</li> <li>② Directional fall and split yard small perennial streams - 75% effective</li> <li>③ Within the unit.</li> <li>④ Maintain unrestricted juvenile migration within small rising channels. - (use temporary crossing structures bridge or fish culverts)</li> <li>⑤ Fish / hydro should consider implementation &amp; mitigation effectiveness.</li> </ul>	
WILDLIFE		
VISUAL/RECREATION		
CULTURAL		
LOGGING SYSTEM		

Old 81-85 unit 3

## 81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)

VCU <u>208</u>	EIS UNIT # <u>3</u>	ACRES <u>2.0</u>	LOGGING SYSTEM <u>H/L</u>	SILVICULTURE OBJECTIVE / PRESCRIPTION: UNIT IS SURROUNDED TO NORTH, EAST, WEST BY NCFL. THE PORTION OF THE UNIT WITH ANY SIGNIFICANT VALUE HAS THE SOIL TYPE 5234B. THIS CALLS FOR PLANTING THIS PARTICULAR AREA TO SITKA SPRUCE SOON AFTER HARVEST. THIS AREA OF THE UNIT IS THE PUMPKINS DO A 1ST SURVEY PRODUCES 1.5 CFS IN APPROXIMATELY 10 YEARS. DO A 2ND SURVEY PRODUCES 1.5 CFS IN APPROXIMATELY 15 YEARS. PCT NEEDS W/ TIMBER OBJECTIVES - JFT. 9-10-89
STAND # <u>AA 03</u>	VOLUME FEET <u>607</u>	VOLUME CRUISE <u>SD5</u>		
SALE NAME <u>34B-376-</u>	PHOTO LINE AND NUMBER <u># 172</u>			
OBJECTIVES Provide volume contour 86-90 operating prior to				HIGH HAZARD AREA <u>5234B-100</u>
				NO SOILS constraints
				RESULTS OF MONITORING:
ROAD LOCATION AND OBJECTIVE		CLOSED ROAD <input checked="" type="checkbox"/>	OPEN ROAD <input type="checkbox"/>	OBJECTIVE / PRESCRIPTION: Black Road after harvest
FISHERIES / HYDROLOGY		CLASS I CROSSING <input type="checkbox"/>	CLASS II CROSSING <input type="checkbox"/>	CLASS III CROSSING <input type="checkbox"/>
OBJECTIVE / PRESCRIPTION:		FHM? <input type="checkbox"/>	TEMPERATURE SENSITIVITY: YES <input type="checkbox"/>	NO <input type="checkbox"/>
WILDLIFE		IN HABITAT FOR OLD GROWTH SPECIES <input checked="" type="checkbox"/>	(See attached)	
RECREATION		VISUAL OBJECTIVE / PRESCRIPTION: SEE ATTRACTORS ASSIGN TO UQO = MODIFICATION	unit meets assigned UQO	
CULTURAL		KNOWN SITE <input type="checkbox"/>	PROBABILITY ZONE: HIGH <input type="checkbox"/> MEDIUM <input type="checkbox"/>	
LOGGING SYSTEM		OBJECTIVE / PRESCRIPTION: H; Ten of year		
REMARKS		Recreation, See Attached		

**PLANNED (ORTHO PHOTO)** SCALE: \_\_\_\_\_



VCC 208

EIS UNIT # 4  
 SALE NAME A/P C SEPARATED BY YA  
22 Acres Vol. FEES = 352  
 PHOTO LINE AND NUMBER 34B 376 172

OBJECTIVES Added on to C.O. unit.

<b>SILVICULTURE</b>		OBJECTIVE / PRESCRIPTION: Clearcut follows with pasture	
MONITORING		Site is a low to medium productivity site. Site under contract from 55 to 75% (Acreage is 25%)	
YES <input type="checkbox"/> NO <input type="checkbox"/>			
<b>RESULTS OF MONITORING:</b>		<b>SOILS</b> OBJECTIVE / PRESCRIPTION: Pre-forest vegetation	
MONITORING		NO soil or seedling activity found	
YES <input type="checkbox"/> NO <input type="checkbox"/>			
<b>RESULTS OF MONITORING:</b>		<b>WATERSHED</b> OBJECTIVE / PRESCRIPTION:	
MONITORING			
YES <input type="checkbox"/> NO <input type="checkbox"/>			
<b>RESULTS OF MONITORING:</b>		<b>FISHERIES</b> OBJECTIVE / PRESCRIPTION:	
MONITORING			
YES <input type="checkbox"/> NO <input type="checkbox"/>			
<b>RESULTS OF MONITORING:</b>		<b>WILDLIFE</b> OBJECTIVE / PRESCRIPTION: Good unit size & boundary configuration. Vehicle disturbance to wildlife	
MONITORING		See attached	
YES <input type="checkbox"/> NO <input type="checkbox"/>		a particular concern because of proximity to Hoanal.	
<b>RESULTS OF MONITORING:</b>		<b>RECREATION</b> OBJECTIVE / PRESCRIPTION: SEE ATTACHED	
MONITORING		ASSIGNED UPO = MODIFICATION, Unit meets	
YES <input type="checkbox"/> NO <input type="checkbox"/>			
<b>RESULTS OF MONITORING:</b>		<b>CULTURAL</b> OBJECTIVE / PRESCRIPTION:	
MONITORING			
YES <input type="checkbox"/> NO <input type="checkbox"/>			
<b>RESULTS OF MONITORING:</b>		<b>LOGGING SYSTEM</b> OBJECTIVE / PRESCRIPTION: Hit and yard	
MONITORING			
YES <input type="checkbox"/> NO <input type="checkbox"/>			
<b>RESULTS OF MONITORING:</b>		<b>ROAD LOCATION AND CONSTRUCTION</b> OBJECTIVE / PRESCRIPTION: Leave Road open to General Traffic	
MONITORING			
YES <input type="checkbox"/> NO <input type="checkbox"/>			
RESULTS OF MONITORING: See Attached			

**PLANNED ( AERIAL PHOTO )**

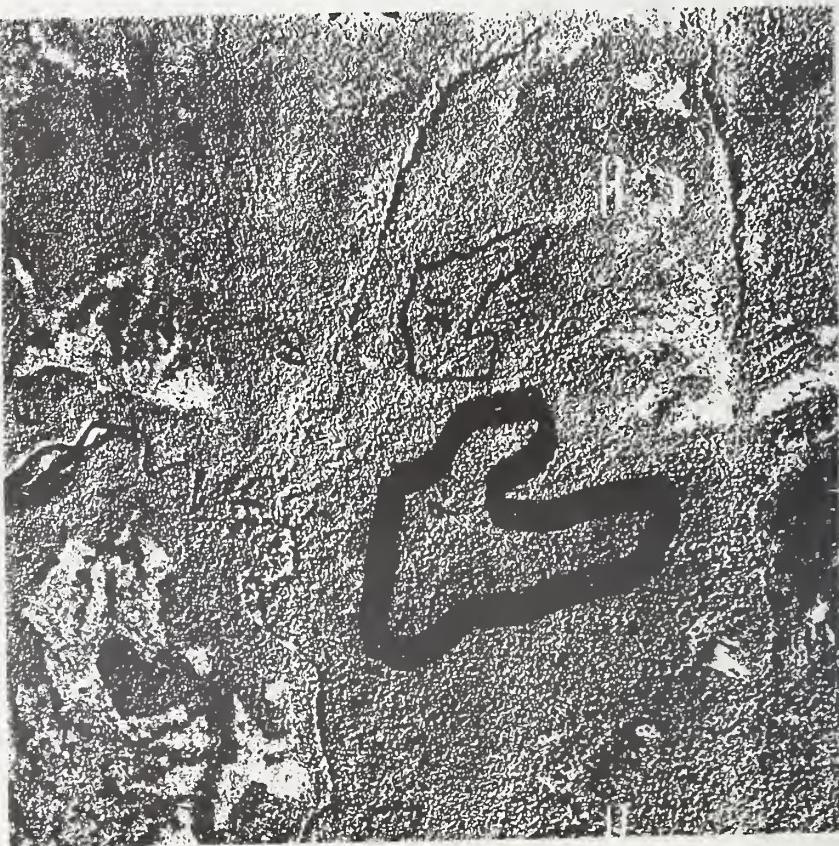
**81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS.)**

VCU <u>208</u>	EIS UNIT # <u>4</u>	ACRES <u>36</u>	LOGGING SYSTEM <u>H</u>	SILVICULTURE <u>None, Favor clearcut followed by planted trees as a medium site (Fair 76).</u>	OBJECTIVE / PRESCRIPTION: Clearcut followed by planted trees as a medium site (Fair 76).
STAND # <u>AAD3</u>	VOLUME FEIS	VOLUME CRUISE <u>110:</u>	PHOTO LINE AND NUMBER <u>34B-36-172</u>	SOILS <u>Private of Unimuline Stell. P.J.</u>	OBJECTIVE / PRESCRIPTION: Private concerns identified.
<u>OBJECTIVES</u> Provide volume for the 86-90 operating period				HIGH HAZARD AREA <u>None</u>	OBJECTIVE / PRESCRIPTION: None
				ROAD LOCATION <u>CLOSED ROAD — LEAVE MAIN LINE RD OPEN TO GENERAL TRAFFIC</u>	ROAD LOCATION / OBJECTIVE: Leave main line Rd open to general traffic
				RESULTS OF MONITORING: <u>Block Spur Road into Unit</u>	RESULTS OF MONITORING: Block Spur Road into Unit
				FISHERIES / HYDROLOGY <u>CLASS I CROSSING — FHMU III TEMPERATURE SENSITIVITY: YES — NO</u>	CLASS I CROSSING — CLASS II CROSSING — CLASS III CROSSING — FHMU III TEMPERATURE SENSITIVITY: YES — NO
				OBJECTIVE / PRESCRIPTION: Protect CLASS III STREAM WATER QUALITY. MAIN ROAD UNIT BOUNDARIES EXC. FROM SIDE-CUTS AND V-NORTHS. SPLIT YARDERS ACROSS V-NORTH. BISECT NEW OLD UNIT AND THE NEW ADDITION.	OBJECTIVE / PRESCRIPTION: Protect CLASS III STREAM WATER QUALITY. MAIN ROAD UNIT BOUNDARIES EXC. FROM SIDE-CUTS AND V-NORTHS. SPLIT YARDERS ACROSS V-NORTH. BISECT NEW OLD UNIT AND THE NEW ADDITION.
				WILDLIFE <u>IN HABITAT FOR OLD GROWTH SPECIES NO (See attached)</u>	WILDLIFE IN HABITAT FOR OLD GROWTH SPECIES NO (See attached)
				OBJECTIVE / PRESCRIPTION: Good unit size & boundary configuration. Vehicle disturbance to wildlife a particular concern because of proximity to Hoonah.	OBJECTIVE / PRESCRIPTION: Good unit size & boundary configuration. Vehicle disturbance to wildlife a particular concern because of proximity to Hoonah.
				VISUAL RECREATION <u>SEE ATTACHED</u>	VISUAL RECREATION: See attached
				CULTURAL <u>Unit meets assigned VQO of Mod</u>	CULTURAL: Known Site — PROBABILITY ZONE: HIGH — MEDIUM —
				LOGGING SYSTEM <u>None from notes + Buffer</u>	LOGGING SYSTEM: Objective / Prescription: Hillside Yard, Fellend yard
				REMARKS <u>Recreation: See attached.</u>	

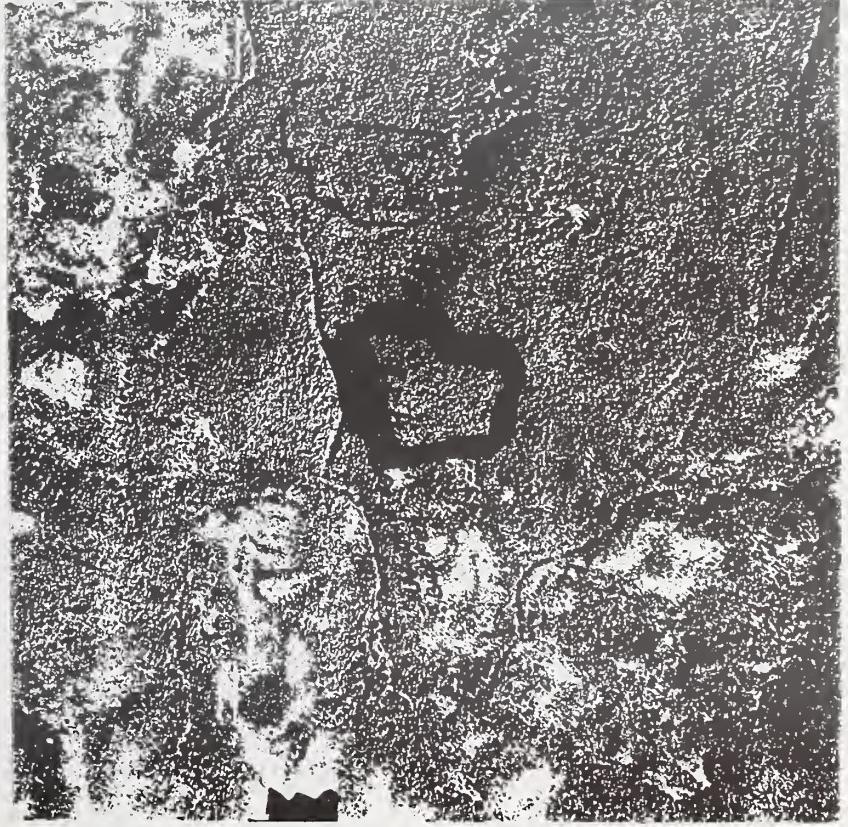


**81 - 90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS.)**

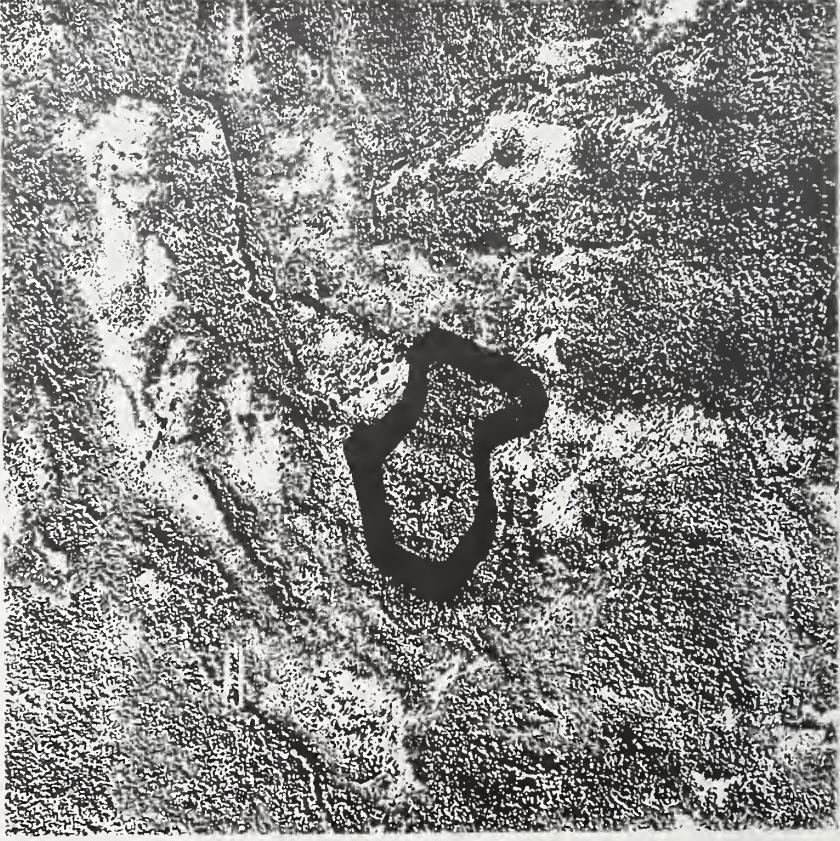
VCU 209	EIS UNIT # <u>11</u>	ACRES <u>50</u>	LOGGING SYSTEM <u>HL</u>	SILVICULTURE OBJECTIVE / PRESCRIPTION: THE LOWER 2/3'S OF THIS UNIT FOLDS INTO THE 5143B SOIL AREA WHICH INDICATES CEDAR MAY BE A MAJOR SPECIES COMPONENT OF THE UNIT. AS THAT IS A LOW PRODUCT- IVITY SITE (S.I. ~60-70%) A PRESCRIBED BURN OF THIS PORTION OF THE UNIT IS CALLED FOR. FOLLOWING THE BURN PLANT THIS AREA FAIRLY M.R. YOUNG CEDAR. ALLOW THE UNBURNT PORTION TO REGENERATE NATURALLY. JPT - 9-10-87
STAND # <u>A9023</u>	VOLUME FEET <u>800</u>	VOLUME CRUISE _____	FLYING SALE NAME <u>37-276 #348</u>	FLYING PHOTO LINE AND NUMBER <u>3645C 80</u>
OBJECTIVES Provide volume for the 86-90 operating period.	5143B- <u>50</u>	HIGH HAZARD AREA _____	RESULTS OF MONITORING: ROAD LOCATION AND OBJECTIVE CLOSED ROAD — OPEN ROAD — BLOCK to vehicle traffic	OBJECTIVE / PRESCRIPTION: NO soils concerns per 3/89
PLANNED ORTHO PHOTO	SCALE: _____	RECREATION VISUAL	FISHERIES / HYDROLOGY FHAW — TEMPERATURE SENSITIVITY: YES — NO —	IN HABITAT FOR OLD GROWTH SPECIES <u>YES</u> (see attached) OBJECTIVE / PRESCRIPTION: Best unit size in deer winter range is 40 acres or less with an average of 10 acres. Close road if possible. because of proximity to Houghah. DK 9/12/89
LOGGING SYSTEM	CULTURAL KNOWN SITE _____ PROBABILITY ZONE: HIGH — MEDIUM —	RECREATION VISUAL	OBJECTIVE / PRESCRIPTION: See ATTACHED Unit meets assigned VPs of Mt.	REMARKS Recreation: See attach J



## 81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)

VCU 209	EIS UNIT # <u>13</u>	ACRES <u>28</u>	LOGGING SYSTEM <u>HL</u>	SILVICULTURE FOR STAND DIVERSITY. ALLOW THIS UNIT TO REGENERATE NATURALLY. THE OVERALL SITE INDEX FOR THIS UNIT IS 83. A PCT @ 12-18 YEARS ENCOMPASSING THE NORTH HALF OF THIS UNIT MAY HAVE WILDLIFE BENEFITS. CONSULT w/ THE WILDLIFE SPECIALISTS AS TO THE FEASIBILITY OF THIS PROJECT. JPT. 9-10-87
STAND #	VOLUME FEIS	745	VOLUME CRUISE	
SALE NAME	<u>AA 03</u>			
PHOTO LINE AND NUMBER	<u>37-276 # 348</u>			
OBJECTIVES	Provide volume for the 86-90 operating period			
ROAD LOCATION AND OBJECTIVE	No soils concessions RW 9/89			
RESULTS OF MONITORING:	CLOSED ROAD	OPEN ROAD	OBJECTIVE / PRESCRIPTION: Block to vehicle traffic	
PLANNED (ORTHO PHOTO)	SCALE:			
FISHERIES / HYDROLOGY	CLASS I CROSSING	CLASS II CROSSING	CLASS III CROSSING	
FMHU 1	TEMPERATURE SENSITIVITY:	YES	NO	
OBJECTIVE / PRESCRIPTION:	Project Class I stream channel initially maintained 100' buffer on North boundary line. Directionally face fencer away from buffer			
WILDLIFE	IN HABITAT FOR OLD GROWTH SPECIES YES (see attached) OBJECTIVE / PRESCRIPTION: This unit lies just above deer winter range. The lower portion of the unit extends down into riparian habitat. The upper portion of this unit has been cut fairly heavily. Close road if possible. Sac. Streamside Riparian			
VISUAL RECREATION	ATTACHED SEE	ATTACHED SEE	ATTACHED SEE	
CULTURAL	KNOWN SITE	PROBABILITY ZONE :	HIGH — MEDIUM —	OBJECTIVE / PRESCRIPTION:
LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION: Hold lead yard, follow yard away from stream bank.			
REMARKS	Perception. See Attached &			

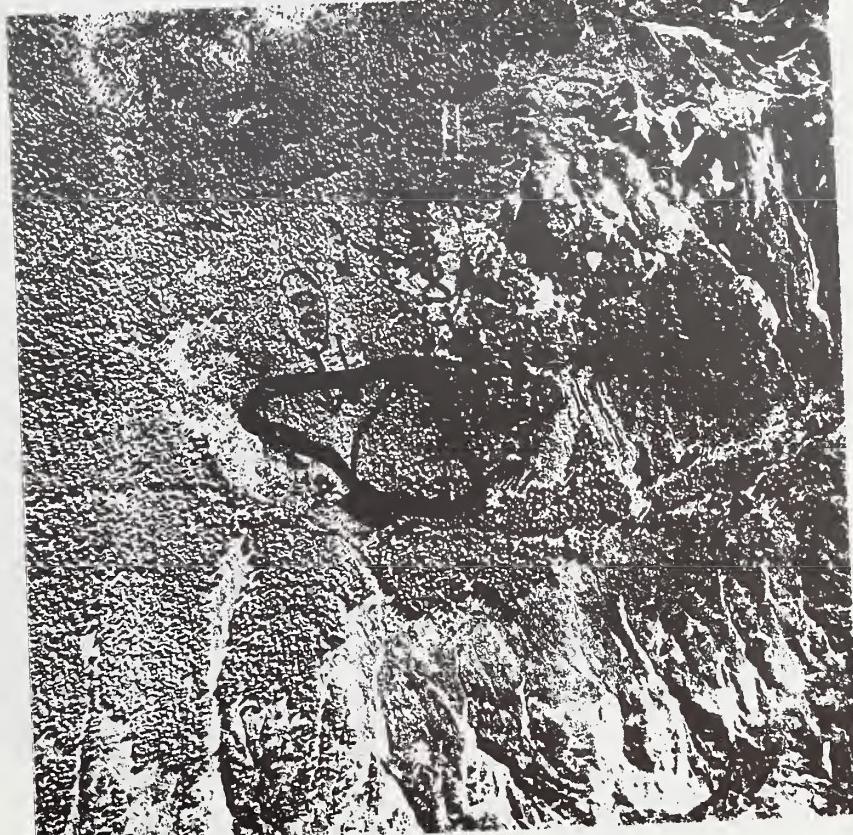
**81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)**

VCU <u>209</u>	EIS UNIT * 14	ACRES <u>43</u>	LOGGING SYSTEM <u>HL</u>	SILVICULTURE OBJECTIVE / PRESCRIPTION: DURING CLEARCUTTING OF THIS UNIT, LEAVE AT LEAST 2 SNAGS/ACRE & AND MAINTAIN 10% OF SAPLINGS FOR STAND DIVERSITY. AS THIS UNIT IS VIRTUALLY SURROUNDED BY NEELEY, AN OUTLINE SHOULD ALSO CONSIDER THE POSSIBILITY OF A FULL PLANT FAVORING SPRUCE. THE REVIEW SHOULD ALSO CONSIDER THE FEASIBILITY OF A PRESCRIBED FIRE INVOLVING THE FOOT-SLOPE OF THE UNIT DUE TO THE POSSIBILITY OF CEDAR BEING A MAJOR SPECIES. SEE <u>SOILS</u> ON THIS SHEET.
STAND # <u>4A</u>	VOLUME FEIS <u>688</u>	VOLUME CRUISE <u>—</u>	SALE NAME <u>4A 03</u>	PHOTO LINE AND NUMBER <u>36B - 376 - #343</u>
OBJECTIVES Provide volume for the 86-90 operating period				SOILS <u>71</u> HIGH HAZARD AREA 61438-225
				PROT. V. NOT ON SITES/ROADS Scouting location. WD Soils con curv's Pw 9/89
RESULTS OF MONITORING: ROAD LOCATION <u>CLOSED ROAD</u> — <u>OPEN ROAD</u> — AND OBJECTIVE <u>Break to vehicle turn off</u>				OBJECTIVE / PRESCRIPTION: Protect V. not on sites/roads Scouting location. WD Soils con curv's Pw 9/89
PLANNED (ORTHO PHOTO)				SCALE: <u>—</u>
				
				FISHERIES / HYDROLOGY CLASS I CROSSING — CLASS II CROSSING — CLASS III CROSSING — FHMU — TEMPERATURE SENSITIVITY: YES — NO — OBJECTIVE / PRESCRIPTION: SMALL UNMADE CHANNEL, YARD AT RIGHT, AHEAD TO PRIVATE CHANNEL.
				WILDLIFE IN HABITAT FOR OLD GROWTH SPECIES <u>NO</u> (see attached) OBJECTIVE / PRESCRIPTION: Good sized unit near riparian habitat. Vehicle access is a particular concern because of proximity to Koooul.
				VISUAL RECREATION OBJECTIVE / PRESCRIPTION: SEE ATTACHED Assisted VQD = good climb meets design VQD of Mot
				CULTURAL KNOWN SITE <u>—</u> PROBABILITY ZONE: HIGH — MEDIUM — OBJECTIVE / PRESCRIPTION:
				LOGGING SYSTEM OBJECTIVE / PRESCRIPTION: Hit end yard, sp 1: + yard noted
				REMARKS <u>Recreation: See attached</u>

# 81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)

VOU <u>209</u>	EIS UNIT # <u>16</u>	ACRES <u>35</u>	LOGGING SYSTEM <u>H/L</u>	SILVICULTURE OBJECTIVE / PRESCRIPTION: THE UNIT AS DRAWN HAS SOME POTENTIAL REGEN. PROBLEMS, PARTICULARLY IN THE SOUTH HALF NEXT TO THE ALDRO SLIDE ZONE AND AT THE BOTTOM OF THE CREEK WHICH RUNS PARALLEL TO A STREAM WHICH FEEDS INTO SINTAHEEV CREEK. CONSIDER DELTETING THE SOUTH HALF OF THE UNIT AND ADJUSTING THE UNIT'S NATURAL BOUNDARIES (SEE PHOTOS).
STAND # <u>AA 03</u>	VOLUME FEIS	<u>921</u>	VOLUME CRUISE	JOT 9-10-89
SALE NAME				
PHOTO LINE AND NUMBER	<u>36 B 376 #346</u>			
OBJECTIVES	Provide volume for the 86-90 operating period.			OBJECTIVE / PRESCRIPTION:  <i>see attached</i>
52846-000-3620	52846-000-3620	52846-000-3620	52846-000-3620	HIGH HAZARD AREA

RESULTS OF MONITORING:		
ROAD LOCATION AND OBJECTIVE	CLOSED ROAD	OPEN ROAD
PLANNED (ORTHO PHOTO)	SCALE: _____	<b>Block To Vehicle Traffic</b>



FISHERIES / HYDROLOGY	CLASS I CROSSING — FNU <u>II</u>	CLASS III CROSSING — NO <u>✓</u>
OBJECTIVE / PRESCRIPTION:	Protect CLASS II Stream Channel Integrity minimum 30' Buffer on western boundary line. & minimum half number away from buffer.	

WILDLIFE	IN HABITAT FOR OLD GROWTH SPECIES <u>NO</u> (see attached)
	OBJECTIVE / PRESCRIPTION: Vehicle access control is an important concern because of the proximity to Hoosah.

VISUAL RECREATION	OBJECTIVE / PRESCRIPTION:  <i>see attached</i>
<b>Assisted VPO = Max Map</b>	

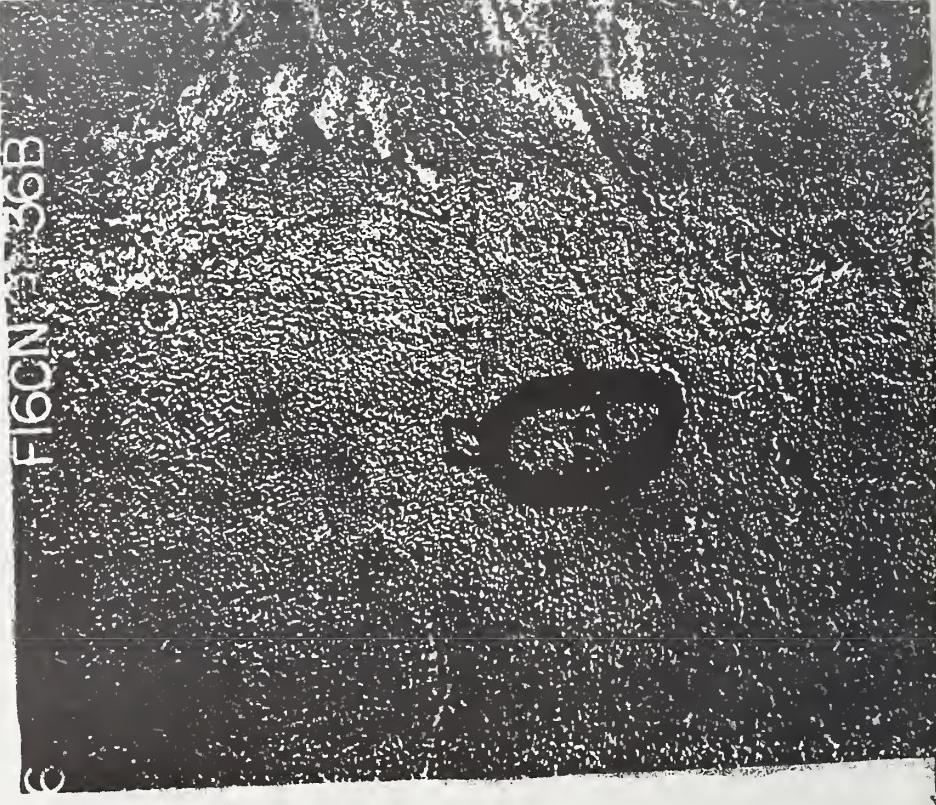
CULTURAL	KNOWN SITE — PROBABILITY ZONE : HIGH — MEDIUM — OBJECTIVE / PRESCRIPTION:
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LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION: Hwy 70m Stream Buffer
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REMARKS: *Recreation: See Attached*

86 - 7D. unit

**86 - 90 UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 86-90 FEIS)**

VCU <u>209</u>	EIS UNIT # <u>17H</u>	ACRES <u>.37</u>	LOGGING SYSTEM <u>H</u>	SILVICULTURE OBJECTIVE / PRESCRIPTION: CLEARCUT + ALLOW FOR NATURAL REGENERATION. DURING THIN & HARVEST, LEAVES AT LEAST 2 SNAGS/AU + ANY CLUMPS OF SPRINGS FOR STAND DIVERSITY. THIS UNIT LIES IN THE OLD GROWTH RETENTION AREA AND IS OF MODERATE PRODUCTIVITY (S.I.=80). SCHEDULE A PCT @ 12-18 YEARS WITH WILDLIFE OBJECTIVES.
STAND <u>1</u>	VOLUME FEIS <u>1141</u>	VOLUME CRUISE <u>—</u>	SH7808	HIGH HAZARD AREA <u>—</u> OBJECTIVE / PRESCRIPTION:
SALE NAME <u>APC 86-90</u>	PHOTO LINE AND NUMBER <u>26 376 343</u>	RESULTS OF MONITORING: <i>No soils concerns identified</i>	ROAD LOCATION AND OBJECTIVE <u>CLOSED ROAD — OPEN ROAD —</u>	OBJECTIVE / PRESCRIPTION:
OBJECTIVES <i>OBJECTIVES cut down unit size. Create East &amp; West side (Some is Adj.) wood being in stand alone</i>		PLANNED <u>1984</u>	scale: <u>15840</u>	
Provide volume for the 86-90 operating period.				
				
FISHERRIES / HYDROLOGY	CLASS I CROSSING <u>—</u>	CLASS II CROSSING <u>—</u>	CLASS III CROSSING <u>—</u>	VISUAL RECREATION
FMHU <u>—</u>	TEMPERATURE SENSITIVITY: YES <u>—</u>	NO <u>—</u>	OBJECTIVE / PRESCRIPTION: <i>No concerns identified</i>	OBJECTIVE / PRESCRIPTION: <i>No concerns identified</i>
No concerns identified		No concerns identified		KNOWN SITE — PROBABILITY ZONE: HIGH — MEDIUM —
No concerns identified		No concerns identified		OBJECTIVE / PRESCRIPTION:
WILDLIFE		IN HABITAT FOR OLD GROWTH SPECIES <u>YES</u>		LOGGING SYSTEM OBJECTIVE / PRESCRIPTION: <i>Felled yard; felled</i>
				REMARKS

NOT APPROVED IN 87  
Recreation: See attached

**81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS.)**

VCU 209 EIS UNIT *	17 SEIS ACRES	25 LOGGING SYSTEM	H/L	SILVICULTURE	OBJECTIVE / PRESCRIPTION: LEAVE AT LEAST 2 SNAGS/ACRE AND ANY CLUMPS OF SECONDLINGS/SAPLINGS FOR STAND DIVERSITY WHEN X-CUTTING THIS UNIT. THE OVERALL SITE INDEX FOR THIS UNIT IS 84 (FAIR). ALLOW THIS UNIT TO REGENERATE NATURALLY. DO NOT PLAN A PCT.
STAND #	VOLUME FEIS	VOLUME CRUISE	—	—	JPT: Q-10-89
SALE NAME	—	—	—	—	—
PHOTO LINE AND NUMBER	37-276 # 345	—	—	—	—
OBJECTIVES	Provide Unit line for the 86-90 operating period.	—	—	321880510084 SK4325	HIGH HAZARD AREA — OBJECTIVE / PRESCRIPTION: <i>See Attached</i>
RESULTS OF MONITORING:				ROAD LOCATION	CLOSED ROAD — OPEN ROAD — OBJECTIVE / PRESCRIPTION: <i>Block 1 Vehicle Access</i>
				AND OBJECTIVE	—
PLANNED (ORTHO PHOTO)				SCALE :	—
					
FISHERIES / HYDROLOGY	CLASS I CROSSING — FHMU —	CLASS II CROSSING — TEMPERATURE SENSITIVITY: YES — NO —	—	WILDLIFE	IN HABITAT FOR OLD GROWTH SPECIES AND See attached OBJECTIVE / PRESCRIPTION: Vehicle Access Control is an important concern because of the proximity to Koonah.
OBJECTIVE / PRESCRIPTION:	NO CONFLUENT IDENTIFIED,	DK-9/12/89	VISUAL RECREATION	SEE ATTACHED	OBJECTIVE / PRESCRIPTION: Unit meets assigned VPO of Max Mod
CULTURAL	KNOWN SITE —	PROBABILITY ZONE : HIGH — MEDIUM —	LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION: any from 'u' noted on Eastern Boundary	REMARKS Recreation; See Attached

**86-90 UNIT LAYOUT AND ROAD LOCATION CARD**

<u>FINAL LAYOUT</u>		<u>SILVICULTURE</u>	<u>OBJECTIVE / PRESCRIPTION:</u>
SALE NAME	TTF	UNIT	RIO-2400-77 ATTACHED
LOGGING SYSTEM	VOLUME:	TEMP. ROAD (FT.)	
ACRES			
INDICATE METHOD USED TO MARK OR DESIGNATE BOUNDARY, TEMP. ROADS, LANDINGS, ETC.			
REMARKS:	<i>None Dated 7/7</i>		
<u>LAYOUT COMPLETED BY:</u> _____ DATE: _____		<u>SOILS</u>	<u>OBJECTIVE / PRESCRIPTION:</u>
		<u>ROAD CONSTRUCTION</u>	<u>REFERENCE:</u> _____
<u>FINAL LAYOUT APPROVED BY:</u> _____ DATE: _____		<u>FISHERIES / HYDROLOGY</u>	<u>OBJECTIVE / PRESCRIPTION:</u>
SILVICULTURE NOTIFIED OF RELEASE:	SILVICULTURIST INITIAL:	DATE:	
ENGINEERING NOTIFIED OF RELEASE:	ENGINEERS INITIAL:	DATE:	
<u>FINAL LAYOUT MAP</u> (ORTHO PHOTO CONTOUR MAP) OR AERIAL PHOTO		<u>WILDLIFE</u>	<u>OBJECTIVE / PRESCRIPTION:</u>
		<i>There is a cleared area of about 10' wide on the hillside, with heavy horses of slate, should be kept this hill until till after entry. Name: Big Dog</i>	
		<u>VISUAL RECREATION</u>	<u>OBJECTIVE / PRESCRIPTION:</u>
CULTURAL	SEE ATTACHMENT WITH CLEARANCE TRACKING FORM	NAME:	DATE:
LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION:	NAME:	DATE:
REMARKS:			

## 81 - 90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)

<b>VCU</b> <u>209</u>	<b>EIS UNIT #</b> <u>2L</u>	<b>ACRES</b> <u>17</u>	<b>LOGGING SYSTEM</b> <u>HLC</u>												
<b>STAND #</b>	<b>VOLUME FEIS</b>	<b>272</b>	<b>VOLUME CRUISE</b>												
<b>SALE NAME</b> <u>BH 03</u>															
<b>PHOTO LINE AND NUMBER</b>	<u>37 - 276 # 348</u>														
<b>OBJECTIVES</b> <i>Provide volume for the 86-90 operating period</i>															
<b>PLANNED (ORTHO PHOTO)</b> <b>SCALE:</b> _____															
															
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;"> <b>SILVICULTURE</b> </td> <td colspan="3"> <b>OBJECTIVE / PRESCRIPTION:</b> THIS UNIT LIES ENTIRELY WITHIN THE SOIL AREA OF 51438 WHICH INDICATES THAT AK YELLOW CEDAR IS A LIKELY SPECIES COMPONENT OF THE UNIT. AS THE UNIT IS IN A LOW PRODUCING AREA (S.I.=55 - FAIR), A PRESCRIBED BURN IS CALLED FOR FOLLOWING HARVEST. FOLLOW THIS BURN WITH A FULL RAINFALL FAVORING AK YELLOW CEDAR. <u>JPT - 9-10-89</u> </td> </tr> <tr> <td><b>ROAD LOCATION</b></td> <td><b>CLOSED ROAD</b></td> <td><b>OPEN ROAD</b></td> <td><b>OBJECTIVE / PRESCRIPTION:</b></td> </tr> <tr> <td><b>AND OBJECTIVE</b></td> <td colspan="3"><u>Block to vehicle access</u></td> </tr> </table>				<b>SILVICULTURE</b>	<b>OBJECTIVE / PRESCRIPTION:</b> THIS UNIT LIES ENTIRELY WITHIN THE SOIL AREA OF 51438 WHICH INDICATES THAT AK YELLOW CEDAR IS A LIKELY SPECIES COMPONENT OF THE UNIT. AS THE UNIT IS IN A LOW PRODUCING AREA (S.I.=55 - FAIR), A PRESCRIBED BURN IS CALLED FOR FOLLOWING HARVEST. FOLLOW THIS BURN WITH A FULL RAINFALL FAVORING AK YELLOW CEDAR. <u>JPT - 9-10-89</u>			<b>ROAD LOCATION</b>	<b>CLOSED ROAD</b>	<b>OPEN ROAD</b>	<b>OBJECTIVE / PRESCRIPTION:</b>	<b>AND OBJECTIVE</b>	<u>Block to vehicle access</u>		
<b>SILVICULTURE</b>	<b>OBJECTIVE / PRESCRIPTION:</b> THIS UNIT LIES ENTIRELY WITHIN THE SOIL AREA OF 51438 WHICH INDICATES THAT AK YELLOW CEDAR IS A LIKELY SPECIES COMPONENT OF THE UNIT. AS THE UNIT IS IN A LOW PRODUCING AREA (S.I.=55 - FAIR), A PRESCRIBED BURN IS CALLED FOR FOLLOWING HARVEST. FOLLOW THIS BURN WITH A FULL RAINFALL FAVORING AK YELLOW CEDAR. <u>JPT - 9-10-89</u>														
<b>ROAD LOCATION</b>	<b>CLOSED ROAD</b>	<b>OPEN ROAD</b>	<b>OBJECTIVE / PRESCRIPTION:</b>												
<b>AND OBJECTIVE</b>	<u>Block to vehicle access</u>														
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;"> <b>FISHERIES / HYDROLOGY</b> </td> <td><b>CLASS I CROSSING</b></td> <td><b>CLASS II CROSSING</b></td> <td><b>CLASS III CROSSING</b></td> </tr> <tr> <td><b>ROAD LOCATION</b></td> <td><u>FMHU</u></td> <td><b>TEMPERATURE SENSITIVITY:</b> YES <u>NO</u></td> <td></td> </tr> <tr> <td><b>AND OBJECTIVE</b></td> <td colspan="3"><b>OBJECTIVE / PRESCRIPTION:</b> NO CONCERN IDENTIFIED</td> </tr> </table>				<b>FISHERIES / HYDROLOGY</b>	<b>CLASS I CROSSING</b>	<b>CLASS II CROSSING</b>	<b>CLASS III CROSSING</b>	<b>ROAD LOCATION</b>	<u>FMHU</u>	<b>TEMPERATURE SENSITIVITY:</b> YES <u>NO</u>		<b>AND OBJECTIVE</b>	<b>OBJECTIVE / PRESCRIPTION:</b> NO CONCERN IDENTIFIED		
<b>FISHERIES / HYDROLOGY</b>	<b>CLASS I CROSSING</b>	<b>CLASS II CROSSING</b>	<b>CLASS III CROSSING</b>												
<b>ROAD LOCATION</b>	<u>FMHU</u>	<b>TEMPERATURE SENSITIVITY:</b> YES <u>NO</u>													
<b>AND OBJECTIVE</b>	<b>OBJECTIVE / PRESCRIPTION:</b> NO CONCERN IDENTIFIED														
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;"> <b>WILDLIFE</b> </td> <td><b>IN HABITAT FOR OLD GROWTH SPECIES</b></td> <td><b>YES</b></td> <td><u>(See attached)</u></td> </tr> <tr> <td><b>ROAD LOCATION</b></td> <td><b>OBJECTIVE / PRESCRIPTION:</b></td> <td colspan="2">Good unit size boundary configuration. Vehicle access is an important concern because of proximity to Hounds. 17 ac. DNR</td> </tr> <tr> <td><b>AND OBJECTIVE</b></td> <td colspan="3"><b>OBJECTIVE / PRESCRIPTION:</b> <u>SEED ATTACHMENT</u> <i>Unit does not meet assigned VPO of Mod.</i></td> </tr> </table>				<b>WILDLIFE</b>	<b>IN HABITAT FOR OLD GROWTH SPECIES</b>	<b>YES</b>	<u>(See attached)</u>	<b>ROAD LOCATION</b>	<b>OBJECTIVE / PRESCRIPTION:</b>	Good unit size boundary configuration. Vehicle access is an important concern because of proximity to Hounds. 17 ac. DNR		<b>AND OBJECTIVE</b>	<b>OBJECTIVE / PRESCRIPTION:</b> <u>SEED ATTACHMENT</u> <i>Unit does not meet assigned VPO of Mod.</i>		
<b>WILDLIFE</b>	<b>IN HABITAT FOR OLD GROWTH SPECIES</b>	<b>YES</b>	<u>(See attached)</u>												
<b>ROAD LOCATION</b>	<b>OBJECTIVE / PRESCRIPTION:</b>	Good unit size boundary configuration. Vehicle access is an important concern because of proximity to Hounds. 17 ac. DNR													
<b>AND OBJECTIVE</b>	<b>OBJECTIVE / PRESCRIPTION:</b> <u>SEED ATTACHMENT</u> <i>Unit does not meet assigned VPO of Mod.</i>														
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;"> <b>CULTURAL</b> </td> <td><b>KNOWN SITE</b></td> <td><b>PROBABILITY ZONE:</b> HIGH <u>MEDIUM</u></td> <td><b>OBJECTIVE / PRESCRIPTION:</b></td> </tr> <tr> <td><b>ROAD LOCATION</b></td> <td colspan="3"></td> </tr> </table>				<b>CULTURAL</b>	<b>KNOWN SITE</b>	<b>PROBABILITY ZONE:</b> HIGH <u>MEDIUM</u>	<b>OBJECTIVE / PRESCRIPTION:</b>	<b>ROAD LOCATION</b>							
<b>CULTURAL</b>	<b>KNOWN SITE</b>	<b>PROBABILITY ZONE:</b> HIGH <u>MEDIUM</u>	<b>OBJECTIVE / PRESCRIPTION:</b>												
<b>ROAD LOCATION</b>															
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;"> <b>LOGGING SYSTEM</b> </td> <td colspan="3"><b>OBJECTIVE / PRESCRIPTION:</b> <u>H1 and Yard</u></td> </tr> <tr> <td><b>ROAD LOCATION</b></td> <td colspan="3"></td> </tr> </table>				<b>LOGGING SYSTEM</b>	<b>OBJECTIVE / PRESCRIPTION:</b> <u>H1 and Yard</u>			<b>ROAD LOCATION</b>							
<b>LOGGING SYSTEM</b>	<b>OBJECTIVE / PRESCRIPTION:</b> <u>H1 and Yard</u>														
<b>ROAD LOCATION</b>															
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;"> <b>REMARKS</b> </td> <td colspan="3"><u>Recreational tree attachment</u></td> </tr> </table>				<b>REMARKS</b>	<u>Recreational tree attachment</u>										
<b>REMARKS</b>	<u>Recreational tree attachment</u>														

**81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)**

VCU <u>209</u>	EIS UNIT # <u>22</u>	ACRES <u>28</u>	LOGGING SYSTEM <u>L/L</u>	SILVICULTURE STAND DIVERSITY. ALLOW FOR NATURAL REGROWTH. THIS WLT LIES ON A HIGH PRODUCTIVITY SITE (S.I.=100-FAIR) & IS LOCATED IN THE OLD GROWTH RETENTION AREA. WHEN PLANNING A PCT CONSIDER THE WILDLIFE BIOLOGIST TO DEVELOP A PCT PRESCRIPTION WHICH ADDRESSES WILDLIFE AS WELL AS TIMBER CONCNS.	OBJECTIVE / PRESCRIPTION: WHEN CLEAR RECLUTTING, LEAVE AT LEAST TWO SNAGS/ACRE + ANY CLIPS OF SEEDLINGS/SPLNGS FOR STAND DIVERSITY. ALLOW FOR NATURAL REGROWTH. THIS WLT LIES ON A HIGH PRODUCTIVITY SITE (S.I.=100-FAIR) & IS LOCATED IN THE OLD GROWTH RETENTION AREA. WHEN PLANNING A PCT CONSIDER THE WILDLIFE BIOLOGIST TO DEVELOP A PCT PRESCRIPTION WHICH ADDRESSES WILDLIFE AS WELL AS TIMBER CONCNS.
STAND # <u>AH 03</u>	VOLUME FEIS <u>512</u>	VOLUME CRUISE <u>—</u>	SOILS <u>362LD-HD</u>	HIGH HAZARD AREA <u>—</u>	OBJECTIVE / PRESCRIPTION: <u>JPT 9-0-87</u>
SALE NAME <u>37-276 # 348</u>	PHOTO LINE AND NUMBER <u>—</u>	OBJECTIVES Provide volume for the 86-90 operating period	RESULTS OF MONITORING: ROAD LOCATION AND OBJECTIVE	CLOSED ROAD — OPEN ROAD — Block to vehicle traffic	OBJECTIVE / PRESCRIPTION: ROAD LOCATION AND OBJECTIVE
PLANNED (ORTHO PHOTO)		SCALE: <u>—</u>			
FISHERIES / HYDROLOGY	CLASS I CROSSING <input checked="" type="checkbox"/>	CLASS II CROSSING <input type="checkbox"/>	CLASS III CROSSING <input type="checkbox"/>	FMU <input type="checkbox"/>	TEMPERATURE SENSITIVITY: YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>
OBJECTIVE / PRESCRIPTION:	No constraints identified				
WILDLIFE	IN HABITAT FOR OLD GROWTH SPECIES Yes (see attached) OBJECTIVE / PRESCRIPTION: DWR-28 ac. Ripon-5 ac. This unit is in a very sensitive location. old growth 28 ac. see item 0 on check sheet for suggested mitigation measures. Close road if possible.				
VISUAL RECREATION	OBJECTIVE / PRESCRIPTION: <u>SEE ATTACH.</u> Unit does not need assigned VPs of PR				
CULTURAL	KNOWN SITE <input type="checkbox"/> PROBABILITY ZONE : HIGH <input checked="" type="checkbox"/> MEDIUM <input type="checkbox"/> OBJECTIVE / PRESCRIPTION: <u>Head yard</u>				
LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION: Head yard				
REMARKS	Recreation: see attached				

## 86 - 90 UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED

VCU Z/10	EIS UNIT # <u>1</u>	SERIALIZED " <u>1</u>	OBJECTIVES
SALE NAME <u>Apc</u>	<u>85 Ac.</u>	<u>91 ac.</u>	RESULTS OF MONITORING:
PHOTO LINE AND NUMBER	<u>383 - 97</u>	<u>1986</u>	SOILS      OBJECTIVE / PRESCRIPTION: MONITORING YES <input type="checkbox"/> NO <input type="checkbox"/>
			WATERSHED      OBJECTIVE / PRESCRIPTION: MONITORING YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> BUFFER ALONG WEST BOUNDARY LINE WITH STREAM CHANNEL DUE 9/12/69
			FISHERIES      OBJECTIVE / PRESCRIPTION: MONITORING YES <input type="checkbox"/> NO <input type="checkbox"/> SEE ABOVE
			RESULTS OF MONITORING: WILDLIFE      OBJECTIVE / PRESCRIPTION: Fairly heavy timber harvest has occurred on the north facing slopes on the other side of the ridge. Close the spur road accessing this unit unless needed for timber in future objectives. Large units MONITORING YES <input type="checkbox"/> NO <input type="checkbox"/> SEE ATTACHED
			RESULTS OF MONITORING: VISUAL RECREATION      OBJECTIVE / PRESCRIPTION: SEE ATTACHED MONITORING YES <input type="checkbox"/> NO <input type="checkbox"/> ASSIGNED VQ = MAX LOAD Unit meets assigned VQ
			RESULTS OF MONITORING: CULTURAL      OBJECTIVE / PRESCRIPTION: MONITORING YES <input type="checkbox"/> NO <input type="checkbox"/>
			RESULTS OF MONITORING: LOGGING SYSTEM AND CONSTRUCTION      OBJECTIVE / PRESCRIPTION: Hill end yard, fell and yard away from stream builder MONITORING YES <input type="checkbox"/> NO <input type="checkbox"/>
			RESULTS OF MONITORING: ROAD LOCATION      OBJECTIVE / PRESCRIPTION: Blocker Public Trk. #1 MONITORING YES <input type="checkbox"/> NO <input type="checkbox"/>



RESULTS OF MONITORING:

WILDLIFE

has occurred on the north facing slopes on the other side of the ridge. Close the spur road accessing this unit unless needed for timber in future objectives. Large units

MONITORING

YES  NO 

SEE ATTACHED

OBJECTIVE / PRESCRIPTION:

DUE 9/12/69

RESULTS OF MONITORING:

VISUAL RECREATION

MONITORING

YES  NO 

ASSIGNED VQ = MAX LOAD

Unit meets assigned VQ

OBJECTIVE / PRESCRIPTION:

SEE ATTACHED

MONITORING

YES  NO  SEE ABOVE

OBJECTIVE / PRESCRIPTION:

RESULTS OF MONITORING:  
WILDLIFE      OBJECTIVE / PRESCRIPTION: Fairly heavy timber harvest has occurred on the north facing slopes on the other side of the ridge. Close the spur road accessing this unit unless needed for timber in future objectives. Large units  
MONITORING  
YES  NO  BUFFER ALONG WEST BOUNDARY LINE WITH STREAM CHANNEL  
DUE 9/12/69

OBJECTIVE / PRESCRIPTION:

SEE ATTACHED

MONITORING

YES  NO 

OBJECTIVE / PRESCRIPTION:

SEE ATTACHED

MONITORING

YES  NO 

RESULTS OF MONITORING:  
LOGGING SYSTEM AND CONSTRUCTION      OBJECTIVE / PRESCRIPTION: Hill end yard, fell and yard away from stream builder  
MONITORING  
YES  NO

OBJECTIVE / PRESCRIPTION:

SEE ATTACHED

MONITORING

YES  NO 

RESULTS OF MONITORING:  
ROAD LOCATION      OBJECTIVE / PRESCRIPTION: Blocker Public Trk. #1  
MONITORING  
YES  NO

OBJECTIVE / PRESCRIPTION:

SEE ATTACHED

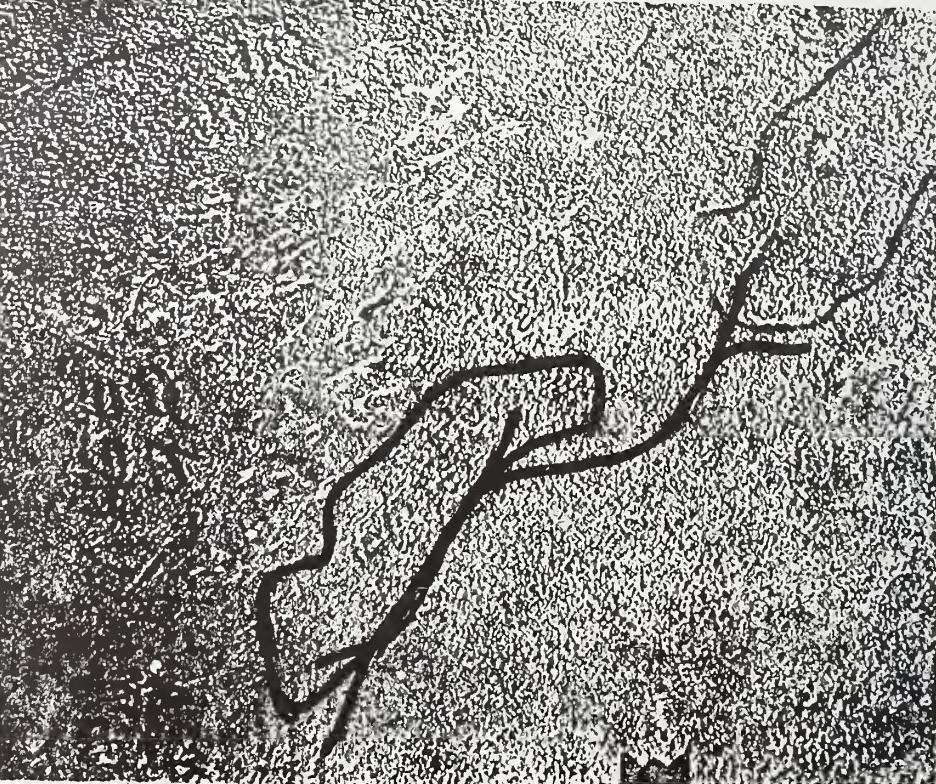
MONITORING

YES  NO 

RESULTS OF MONITORING:  
Levee: See Attached

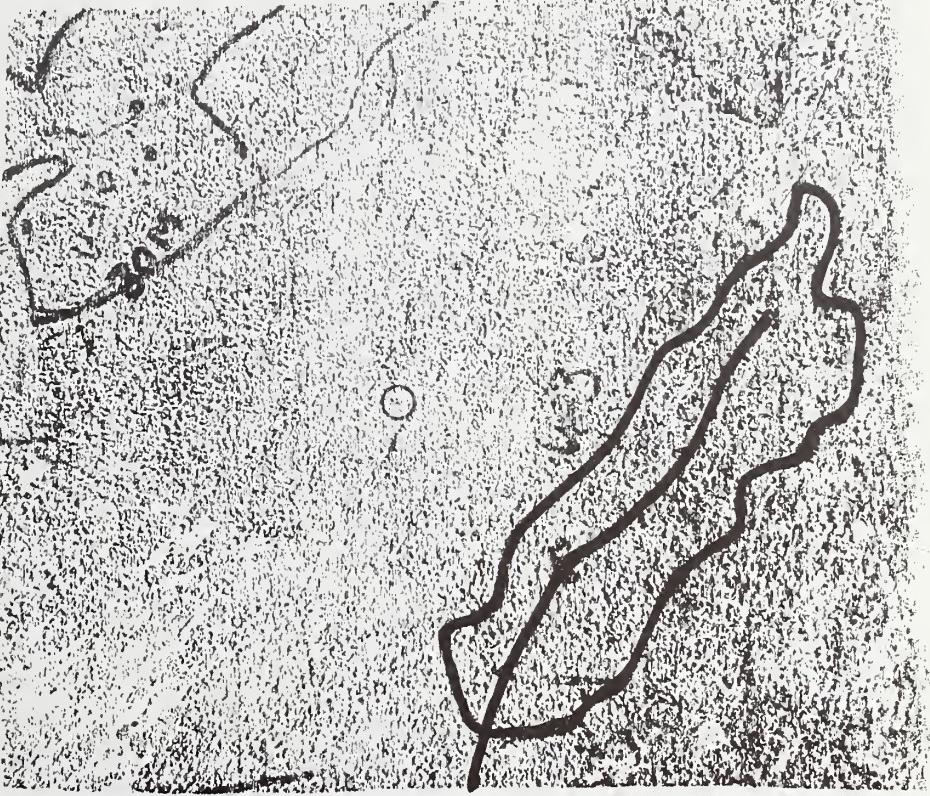
## 86 - 90 UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED

VCU	<u>210</u>	<u>SERIALIZED</u>	<u>2</u>	<u>EIS UNIT #</u>	<u>54 AC. A.P.C.</u>	<u>FET'S</u>	<u>VBL = 1750</u>
SALE NAME	<u>1:PC</u>	<u>1:PC</u>	<u>1:PC</u>	<u>PHOTO LINE AND NUMBER</u>	<u>393</u>	<u>476</u>	<u>57</u>
<b>OBJECTIVES</b>							
RESULTS OF MONITORING:							
SILVICULTURE							
OBJECTIVE / PRESCRIPTION: Clear cut followed with reforestation and regeneration. This is a heavily produced area with a medium productivity.							
MONITORING YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> On the lower portion gradient is medium productivty, coverage of 2 ranges per acre for diversity.							
RESULTS OF MONITORING:							
SOILS							
OBJECTIVE / PRESCRIPTION: Soils required for reclamation							
MONITORING YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> Slope stability, Active slide path and steep slopes indicated. RCU 9/89							
RESULTS OF MONITORING:							
WATERSHED							
OBJECTIVE / PRESCRIPTION:							
MONITORING YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> No concern DENT/FEB							
RESULTS OF MONITORING:							
FISHERIES							
OBJECTIVE / PRESCRIPTION:							
MONITORING YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> No concern DENT/FEB							
RESULTS OF MONITORING:							
WILDLIFE							
OBJECTIVE / PRESCRIPTION: See attached.							
MONITORING YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> Road density on N.E. Chickagof is a concern.							
RESULTS OF MONITORING:							
VISUAL RECREATION							
OBJECTIVE / PRESCRIPTION: See Attached							
MONITORING YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> Assisted VPO = max reclamation							
RESULTS OF MONITORING: Undeveloped VPO							
CULTURAL							
OBJECTIVE / PRESCRIPTION:							
MONITORING YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>							
RESULTS OF MONITORING:							
LOGGING SYSTEM							
OBJECTIVE / PRESCRIPTION: See attached letter							
MONITORING YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> Dated 12/8/88.							
RESULTS OF MONITORING:							
ROAD LOCATION AND CONSTRUCTION				OBJECTIVE / PRESCRIPTION:			
				<u>Block to Public via</u>			
MONITORING YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>							
RESULTS OF MONITORING:							
<i>Recreation: See attached</i>							



**86 - 90 UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED**

VCU #	EIS UNIT #	SERIALIZED #	FEES:	OBJECTIVE / PRESCRIPTION: Clearcut followed by natural regeneration. This is a moderately productive site average site in date is 80 (Farr). Retain an acre. 8 2 swags per acre for diversity.
SALE NAME	AFC	149cc	101:	
PHOTO LINE AND NUMBER	29B	6	7	
OBJECTIVES	North western sub of road in unit should be fields checked			
RESULTS OF MONITORING:				
SILVICULTURE	MONITORING	YES <input type="checkbox"/> NO <input type="checkbox"/>	RESULTS OF MONITORING:	
SOILS	MONITORING	YES <input type="checkbox"/> NO <input type="checkbox"/>	RESULTS OF MONITORING:	SOIL fixed review needed to gain word from boundary. Blind bags require multiple settings and deflection to avoid excessive soil scuffication. EWS 9/89
WATERSHED	MONITORING	YES <input type="checkbox"/> NO <input type="checkbox"/>	RESULTS OF MONITORING:	PROTECT CLASS III STREAM WATER QUALITY / MAINTAIN SO' BUFFER WITH HILLSIDE CHANNEL ALONG SOUTHERN BOUNDARY. See PHOTO 37B-E3. SPOT YARDING, DIRECTIONAL FLOW AWAY FROM CHANNEL, DK 9/12/89
FISHERIES	MONITORING	YES <input type="checkbox"/> NO <input type="checkbox"/>	RESULTS OF MONITORING:	FLASH CLEARCUT WITHIN 48 HRS. FOR CLASS III CHANNEL WIND UNIT. SEE ABOVE
RECREATION	MONITORING	YES <input type="checkbox"/> NO <input type="checkbox"/>	RESULTS OF MONITORING:	OBJECTIVE / PRESCRIPTION: See attached
WILDLIFE	MONITORING	YES <input type="checkbox"/> NO <input type="checkbox"/>	RESULTS OF MONITORING:	LARGE UNITS RESTRICT FUTURE OPTIONS TO MAINTAIN WILDLIFE HABITAT DIVERSITY.
CULTURAL	MONITORING	YES <input type="checkbox"/> NO <input type="checkbox"/>	RESULTS OF MONITORING:	OBJECTIVE / PRESCRIPTION: SEE ATTACHED MAX ASSOCIATED UPD = MODIFICATION
LOGGING SYSTEM	MONITORING	YES <input type="checkbox"/> NO <input type="checkbox"/>	RESULTS OF MONITORING:	OBJECTIVE / PRESCRIPTION: Hit end yard, fell end yard away from stream buffers. Unit as layed out avoid 5 blind leads
ROAD LOCATION AND CONSTRUCTION	MONITORING	YES <input type="checkbox"/> NO <input type="checkbox"/>	RESULTS OF MONITORING:	OBJECTIVE / PRESCRIPTION: Block to Public Traffic
RECREATION See Attached				



AI SO SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 8I-90 SEIS)

WCU	210	EIS UNIT #	<u>6</u>	ACRES	<u>70</u>	LOGGING SYSTEM	<u>HILL</u>	SILVICULTURE OBJECTIVE / PRESCRIPTION: Regenerate site.	Clearcut followed by natural regeneration. Site is a good site predominantly young growth. Substitute timber along S. boundary along stream channel. Retain one tree per acre for diversity.			
STAND #		VOLUME FEIS	<u>1120</u>	VOLUME CRUISE		(For site 91) Exclude one north and east boundary low risk areas.						
SALE NAME	<u>AA 03</u>	PHOTO LINE AND NUMBER	<u>3935-476-87</u>			and at ages 12-16 yrs. pct with a timber emphasis. Retain one tree per acre for diversity.						
OBJECTIVES	Provide volume for the 86-90 operating period						SOILS HIGH HAZARD AREA	OBJECTIVE / PRESCRIPTION :				
<i>S.A. pg 3</i>								RESULTS OF MONITORING:				
		ROAD LOCATION	<u>CLOSED ROAD</u>	<u>OPEN ROAD</u>	<u>—</u>	<u>—</u>	<u>—</u>	OBJECTIVE / PRESCRIPTION:				
		AND OBJECTIVE	<u>Block to Publicized Traffic.</u>									
PLANNED (ORTHO PHOTO)		SCALE:							FISHERIES / HYDROLOGY	CLASS I CROSSING — FHMU <u>II</u> TEMPERATURE SENSITIVITY: YES — NO —	CLASS II CROSSING — FHMU <u>II</u> TEMPERATURE SENSITIVITY: YES — NO —	CLASS III CROSSING — FHMU <u>II</u> TEMPERATURE SENSITIVITY: YES — NO —
									OBJECTIVE / PRESCRIPTION:	PROTECT Class II Stream Channel integrity. MAINTAIN SO Buffer along North East Boundary line within valley bottom channel. Eventually find timber away from buffer by 9/12/89		
WILDLIFE		IN HABITAT FOR OLD GROWTH SPECIES	<u>No</u>						WILDLIFE OBJECTIVE / PRESCRIPTION:	OK. with Silvicultural Rx. Best to do a commercial thin.		
VISUAL RECREATION		ASSIGNED VPD = MAX WLD							VISUAL RECREATION OBJECTIVE / PRESCRIPTION:	<i>Unit meets assigned VPD</i>		
CULTURAL		KNOWN SITE							CULTURAL OBJECTIVE / PRESCRIPTION:	PROBABILITY ZONE : HIGH — MEDIUM —		
LOGGING SYSTEM								LOGGING SYSTEM OBJECTIVE / PRESCRIPTION:	Hold yard and away from stream buffer			
REMARKS: See Attached												



## RECD 81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)

VCU <u>210</u>	EIS UNIT # <u>7</u>	ACRES <u>90</u>	LOGGING SYSTEM <u>HL</u>	SILVICULTURE by natural regeneration. This unit is on medium to low productivity sites. The better portion of the unit is non-CFL (unsustainable). Retain enough at an average of 2 per acre.				
STAND # <u>AA</u>	VOLUME FEIS <u>1440</u>	VOLUME CRUISE <u>—</u>						
SALE NAME <u>AB 03</u>								
PHOTO LINE AND NUMBER	<u>39B 47C - 88</u>							
<u>OBJECTIVES</u>	Provide volume for the 86-90 operating period.							
PLANNED (ORTHO PHOTO)	SCALE:							
<p>RESULTS OF MONITORING:</p> <table border="1"> <tr> <td>ROAD LOCATION AND OBJECTIVE</td> <td>CLOSED ROAD</td> <td>OPEN ROAD</td> <td>OBJECTIVE / PRESCRIPTION: <i>Close to Public Vehicle Traffic</i></td> </tr> </table>					ROAD LOCATION AND OBJECTIVE	CLOSED ROAD	OPEN ROAD	OBJECTIVE / PRESCRIPTION: <i>Close to Public Vehicle Traffic</i>
ROAD LOCATION AND OBJECTIVE	CLOSED ROAD	OPEN ROAD	OBJECTIVE / PRESCRIPTION: <i>Close to Public Vehicle Traffic</i>					
FISHERIES / HYDROLOGY	CLASS I CROSSING	CLASS II CROSSING	CLASS III CROSSING					
TEMPERATURE	YES	NO						
OBJECTION / PRESCRIPTION:	PROTECT CLASS III STREAM WATER QUALITY / SOIL YARD LEVEL SIDEWALKS. DIRECTIONAL FAUCETS AWAY FROM CHANNEL, SLASH CLEAR CUT WITHIN 48 HRS. NO BUFFER MENTIONED RAZ							
WILDLIFE	IN HABITAT FOR OLD GROWTH SPECIES	NO	(See attached)	DX 9/1/69				
OBJECTION / PRESCRIPTION:	TRY TO PROTECT NON-CFL (unsustainable) PORTION IN THE MIDDLE OF THE UNIT TO PROVIDE HABITAT DIVERSITY.							
VISUAL RECREATION	OBJECTION / PRESCRIPTION: SEE ATTACHED DESIGNATED VPO = MAX VPO Unit meets assigned VPO							
CULTURAL	KNOWN SITE	PROBABILITY ZONE: HIGH	MEDIUM	OBJECTION / PRESCRIPTION:				
<p>LOGGING SYSTEM OBJECTION / PRESCRIPTION: High seas and Year 2, Follow out away from stream bank after 50 ft. and separate settings on either side of noted.</p>								
REMARKS: Reservation: See attached								



**81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)**

STAND #	VOLUME FEIS	EIS UNIT #	ACRES H/D	LOGGING SYSTEM H/L	SILVICULTURE OBJECTIVE / PRESCRIPTION: Clear cut harvest followed by natural regeneration. This is the Indore 91 (Farr). Other timber on southern boundary and substitute on north and East Boundary. Presume and thin with a Rubin emphasis at 12-18 yrs. of age. Retain an average of 2 snags per acre for diversity.
SALE NAME	PHOTO LINE AND NUMBER	39B - 476-87			
<b>OBJECTIVES</b> Provide volume for the 86-90 operations Provide					HIGH HAZARD AREA OBJECTIVE / PRESCRIPTION: <i>S, A,</i>
RESULTS OF MONITORING:					
ROAD LOCATION AND OBJECTIVE		CLOSED ROAD —	OPEN ROAD —	OPEN ROAD —	OBJECTIVE / PRESCRIPTION: Block All units down closed
PLANNED (ORTHO PHOTO)		SCALE: _____			
FISHERIES / HYDROLOGY	CLASS I CROSSING —	CLASS II CROSSING —	CLASS III CROSSING —	FISH & TEMPERATURE SENSITIVITY: YES — NO —	
OBJECTIVE / PRESCRIPTION: Protect class II stream water quality / spirit variance difference failing away from channel					
WILDLIFE	IN HABITAT FOR OLD GROWTH SPECIES NO (See attached) with silvicultural Rx. Large units will limit options in future entries. It will be difficult to maintain habitat diversity over the entire rotation period.				
VISUAL RECREATION	OBJECTIVE / PRESCRIPTION: See attached Unit nets assigned Vgo of Mex. Mod.				
CULTURAL	KNOWN SITE — PROBABILITY ZONE : HIGH — MEDIUM — OBJECTIVE / PRESCRIPTION :				
LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION: Head yard fall and yard away from stream bank. Split yard away from buffer				
REMARKS	Recreation: See attached				

**81 - 90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81 - 90 SEIS.)**

VCU <u>2/12</u>	EIS UNIT # <u>9</u>	ACRES <u>70</u>	LOGGING SYSTEM <u>H-L</u>	SILVICULTURE OBJECTIVE / PRESCRIPTION: Clear cut followed with burn favoring Black K. Yellow Cedar. This is a medium size (55-80) with an average ST of 65 (Farr). Delete the non CFL on northern boundary and add on the east & south boundary. as per photo.
STAND # <u>14 03</u>	VOLUME FEIS	<u>1491</u>	VOLUME CRUISE	
SALE NAME				
PHOTO LINE AND NUMBER				
<b>OBJECTIVES</b> Provide volume for the 86-90 operating period				NO CONCERN RCU 2/89
				NO HAZARD AREA
				OBJECTIVE / PRESCRIPTION:
RESULTS OF MONITORING:				
ROAD LOCATION AND OBJECTIVE		CLOSED ROAD — OPEN ROAD —	SEASONAL USE	OPEN 5/1 THRU 7/31
PLANNED (ORTHO PHOTO)		SCALE:		
FISHERIES / HYDROLOGY	CLASS I CROSSING — FMNU	CLASS II CROSSING — TEMPERATURE SENSITIVITY: YES NO	CLASS III CROSSING —	
OBJECTIVE / PRESCRIPTION:		NO CONCERN'S DRAFTED.	DK 9/17/89	
WILDLIFE	IN HABITAT FOR OLD GROWTH SPECIES Yes (See attached) OBJECTIVE / PRESCRIPTION: Best unit size in deer winter range is 40 acres or less with an average of 10 acres. Large units restrict future options of make it difficult to maintain habitat diversity throughout the rotation VISUAL RECREATION OBJECTIVE / PRESCRIPTION: SEE ATTACHED and map assigned VPO of Wd.			
CULTURAL	KNOWN SITE — PROBABILITY ZONE : HIGH — MEDIUM — OBJECTIVE / PRESCRIPTION :			
LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION: H-L end year 4.			
REMARKS Recreation: See Attached				

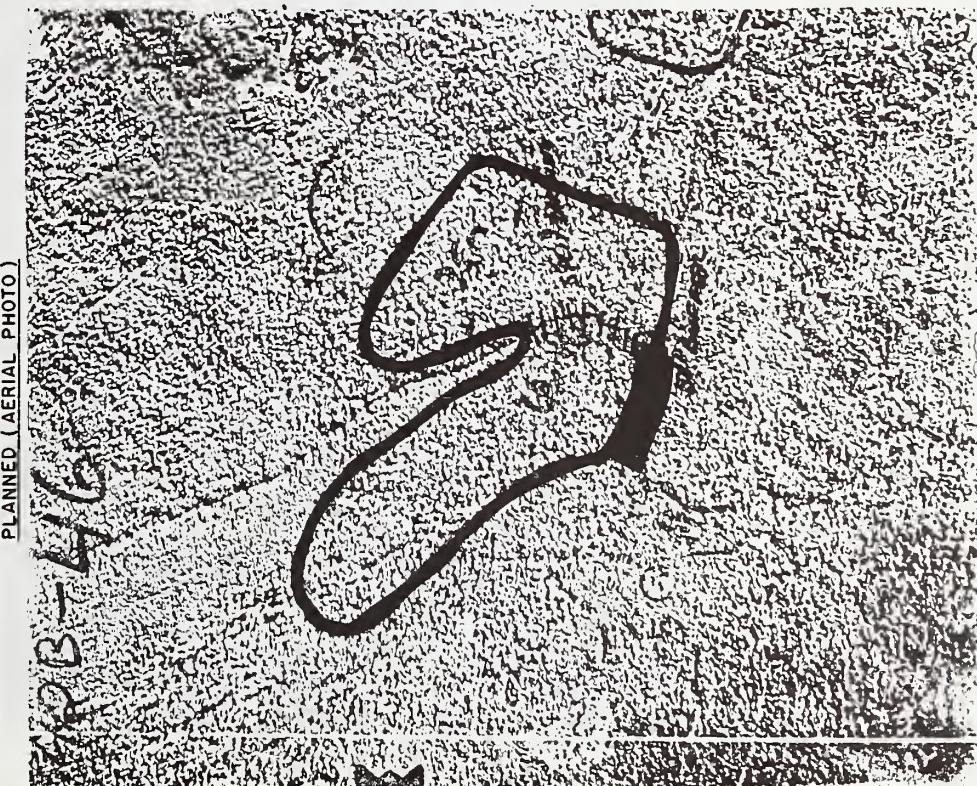
**81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER BI-90 SEIS)**

VCU <u>210</u>	EIS UNIT # <u>10</u>	ACRES <u>12</u>	LOGGING SYSTEM <u>HLL</u>	SILVICULTURE OBJECTIVE / PRESCRIPTION: Clearcut to ground surface. This is a medium site. Ave. site in due is 76 (Fair)
STAND #	VOLUME FEIS	1312	VOLUME CRUISE	
SALE NAME <u>BB 03</u>	PHOTO LINE AND NUMBER	38B - 474 - 96		
<b>OBJECTIVES</b> Provide volume for the 86-90 operating period				SOILS HIGH HAZARD AREA Blind Roads, rocky soil in soil scarification
				OBJECTIVE / PRESCRIPTION: R.W. 9/84
RESULTS OF MONITORING:				ROAD LOCATION CLOSED ROAD — OPEN ROAD — AND OBJECTIVE Block Alluvium Closed
PLANNED (ORTHO PHOTO)				ROAD LOCATION / PRESCRIPTION: SCALE: _____
				FISHERIES / HYDROLOGY FHMU <u>16</u> TEMPERATURE SENSITIVITY: YES — NO OBJECTIVE / PRESCRIPTION: No concern IDEN/FF/ED OK 9/12/89
WILDLIFE				IN HABITAT FOR OLD GROWTH SPECIES <u>NO (See attached)</u> OBJECTIVE / PRESCRIPTION:
VISUAL RECREATION				OBJECTIVE / PRESCRIPTION: See Attached ASSUMED VPO = MODIFICATION that meets assigned VPO
CULTURAL				KNOWN SITE PROBABILITY ZONE: HIGH — MEDIUM — OBJECTIVE / PRESCRIPTION:
LOGGING SYSTEM				OBJECTIVE / PRESCRIPTION: High end yard locate lands. to a road blind ends.
REMARKS				Recreation: see attached



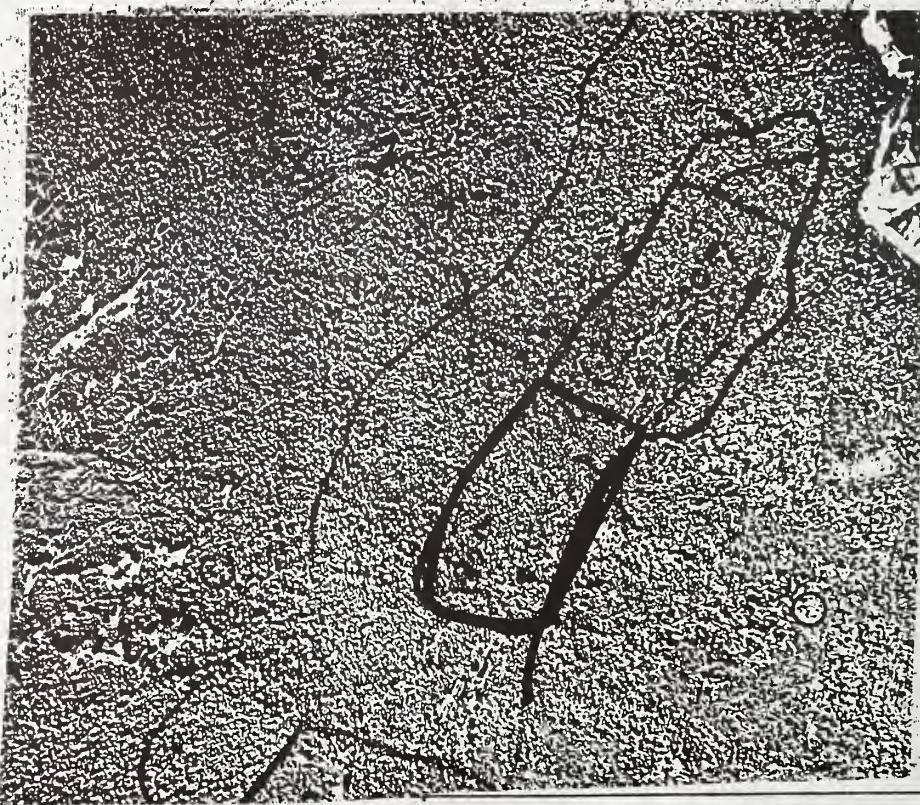
## 86 - 90 UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED

VCU	EIS UNIT #	<u><b>12</b></u>	<u><b>12</b></u>	SILVICULTURE	OBJECTIVE / PRESCRIPTION: Clearcut harvest followed by natural regeneration. This unit varies from the farm to high productivity. Far site endures range from 76-100. (Avg is 88). Retain one acre of 2 stands.
SALE NAME	PIPE	FEET AC.	155	MONITORING	NO <input type="checkbox"/> NO <input checked="" type="checkbox"/>
PHOTO LINE AND NUMBER	411	176	250	RESULTS OF MONITORING:	an acre for deer study.
OBJECTIVES		SOILS	OBJECTIVE / PRESCRIPTION:		
		MONITORING	YES <input type="checkbox"/> NO <input type="checkbox"/>		
RESULTS OF MONITORING:					
WATERSHED		MONITORING	PROJECT CLASS II STREAM CHANNEL / MAINTAIN 50' BOUNDARY ALONG SOUTH LINE WITH STREAM CHANNEL.	OBJECTIVE / PRESCRIPTION:	
		YES <input type="checkbox"/> NO <input type="checkbox"/>	PROJECT CLASS III STREAM WATER QUALITY / SPLIT HARVEST YARD AWAY FROM V-GROVE IN CENTER OF UNIT. SLASH CLEAR CUT WITHIN 96 HRS.		
RESULTS OF MONITORING:		RESULTS OF MONITORING:		RESULTS OF MONITORING:	
FISHERIES		MONITORING	PROJECT CLASS IV FISH HABITAT / MAINTAIN 155 AC.	OBJECTIVE / PRESCRIPTION:	
		YES <input type="checkbox"/> NO <input type="checkbox"/>	SEE ABOVE		
WILDLIFE		MONITORING	PROJECT CLASS V WILDLIFE HABITAT / MAINTAIN 155 AC.	OBJECTIVE / PRESCRIPTION:	
		YES <input type="checkbox"/> NO <input type="checkbox"/>	MANAGED AS OLD GROWTH. BEST UNIT SIZE TO MAINTAIN OLD GROWTH LIKE DIVERSITY IS 10 AC. OR LESS. THIS SOUTH FACING UNIT IS LIKELY TO GET CONSIDERABLE FALL & WINTER DEER USE. VEHICLE ACCESS SHOULD BE RESTRICTED TO PREVENT OLD GROWTH GROWTH DISTURBANCE.		
RECREATION		MONITORING	PROJECT CLASS VI RECREATION / MAINTAIN 155 AC.	OBJECTIVE / PRESCRIPTION:	
		YES <input type="checkbox"/> NO <input type="checkbox"/>	SEE ATTACHED		
VISUAL		MONITORING	PROJECT CLASS VII VISUAL DISTURBANCE / MAINTAIN 155 AC.	OBJECTIVE / PRESCRIPTION:	
		YES <input type="checkbox"/> NO <input type="checkbox"/>	SEE ATTACHED		
CULTURAL		MONITORING	PROJECT CLASS VIII CULTURAL / MAINTAIN 155 AC.	OBJECTIVE / PRESCRIPTION:	
		YES <input type="checkbox"/> NO <input type="checkbox"/>	SEE ATTACHED		
RESULTS OF MONITORING:					
LOGGING SYSTEM		MONITORING	PROJECT CLASS IX LOGGING / MAINTAIN 155 AC.	OBJECTIVE / PRESCRIPTION: Headland Yards. Yards away from stream buffer.	
		YES <input type="checkbox"/> NO <input type="checkbox"/>	NO <input type="checkbox"/>		
RESULTS OF MONITORING:					
ROAD LOCATION AND CONSTRUCTION		MONITORING	PROJECT CLASS X ROAD / MAINTAIN 155 AC.	OBJECTIVE / PRESCRIPTION: Seasonal use open 5/1 - 7/31	
		YES <input type="checkbox"/> NO <input type="checkbox"/>	NO <input type="checkbox"/>		
RESULTS OF MONITORING:					
<i>Redaction; See Attached</i>					

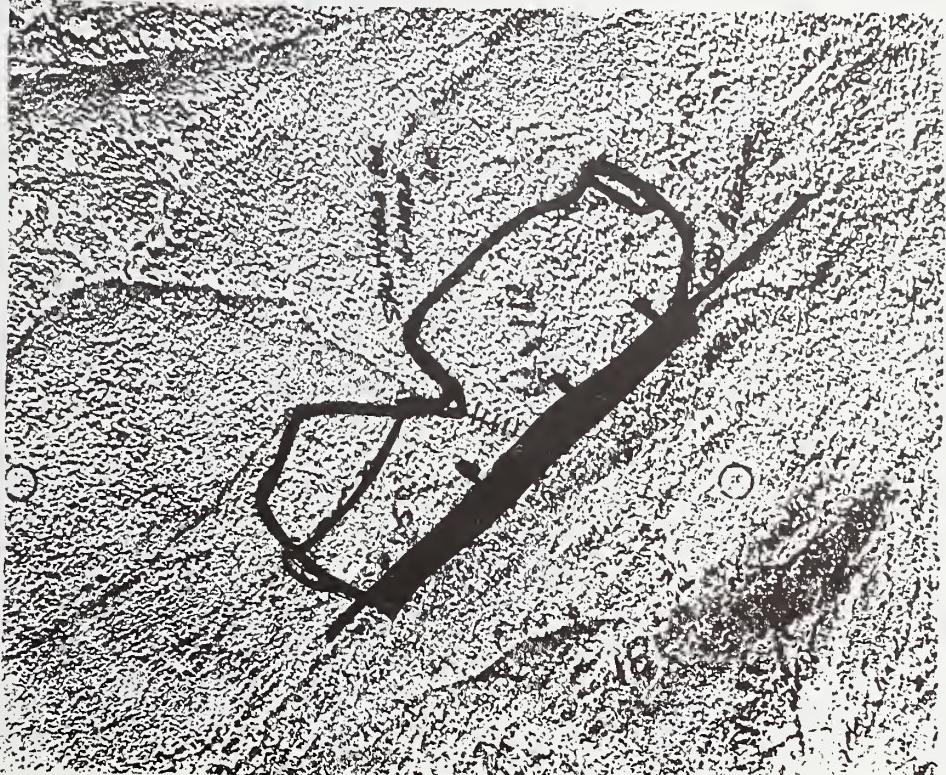


**86 - 90 UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED**

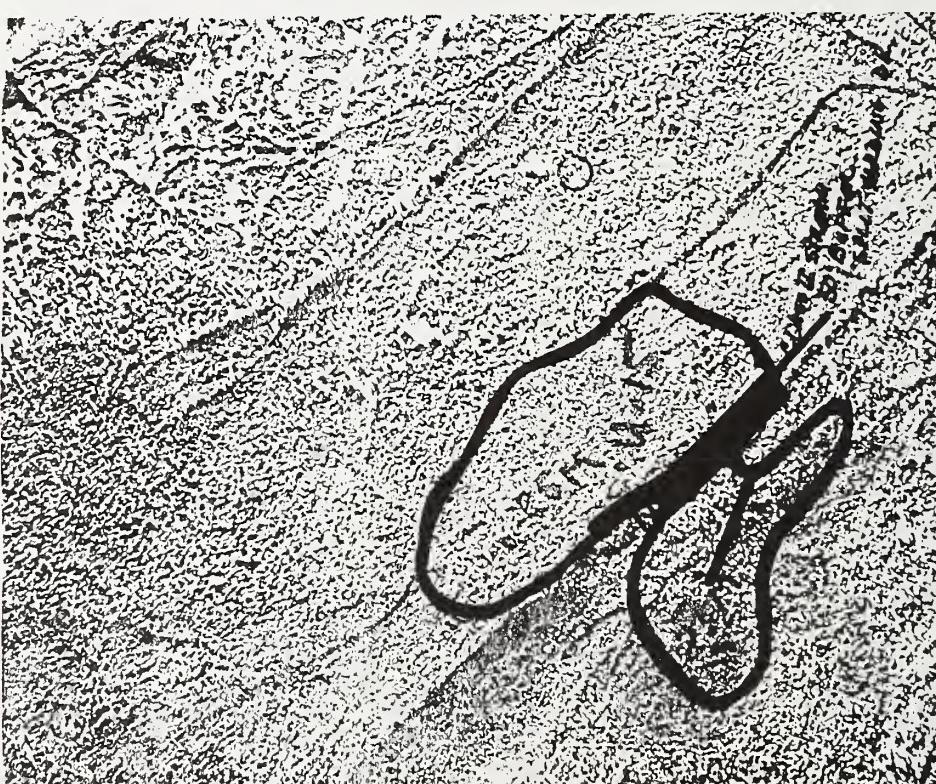
VCU # <u>10</u>	EIS UNIT # <u>13</u>	SEPARATED # <u>12</u>	PESS <u>59 AC. 30 ac. vol = 917</u>	SILVICULTURE MONITORING YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> Pre commercial thinning is a low impact, productive emphasis. Retain an ave. of 2 snags per acre for diversity.	OBJECTIVE / PRESCRIPTION: naturalized no disturbance. Two as a low impact, productive unit with an average site index of 100 (ft and) pre commercial thinning at age 12-18 yrs with a wildlife emphasis. Retain an ave. of 2 snags per acre for diversity.
SALE NAME <u>BPC</u>		PHOTO LINE AND NUMBER <u>41 - 176 250</u>		RESULTS OF MONITORING:	
OBJECTIVES line runs along Native Allotment. Planning for 20 year unit.				SOILS MONITORING YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	OBJECTIVE / PRESCRIPTION:
				RESULTS OF MONITORING:	
				WATERSHED MONITORING YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> Stream water quality / directional failure away from channel. Annual monitoring on road crossing streamlines	OBJECTIVE / PRESCRIPTION: Protect class III stream water quality / directional failure away from channel. Annual monitoring on road crossing streamlines
				RESULTS OF MONITORING:	
				FISHERIES MONITORING YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	OBJECTIVE / PRESCRIPTION:
				RESULTS OF MONITORING:	
				WILDLIFE MONITORING YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> Unit size to maintain old growth like values is 40 acres or less with an average of 10 acres. Unit should not be over 10 acres unless mitigated by visual recreation.	OBJECTIVE / PRESCRIPTION: A field review of this unit was conducted on this unit on 8-9-88. Best unit size to maintain old growth like values is 40 acres or less with an average of 10 acres. Unit should not be over 10 acres unless mitigated by visual recreation.
				RECREATION MONITORING YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> See attached	OBJECTIVE / PRESCRIPTION: See attached
				RESULTS OF MONITORING:	
				CULTURAL MONITORING YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	OBJECTIVE / PRESCRIPTION:
				LOGGING SYSTEM MONITORING YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> every 40m stream.	OBJECTIVE / PRESCRIPTION: Hazard yard. Fell and yard
				ROAD LOCATION AND CONSTRUCTION MONITORING YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	Season use area 5/1 - 7/31
				RESULTS OF MONITORING:	
					Results of monitoring: See attached



## 86 - 90 UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED

VCU	210	EIS UNIT #	<u>14</u>	STREETS "	<u>FEPS</u>	<u>14</u>	SILVICULTURE	OBJECTIVE / PRESCRIPTION: Clearcut harvest followed by natural regeneration. This is a medium product with site (Fan size 85). Retain an average of 2 snags per acre for diversity.		
SALE NAME	APC	AC.	<u>121</u>	<u>Vol</u> = <u>3091</u>	MONITORING	<input type="checkbox"/> YES <input type="checkbox"/> NO	MONITORING			
PHOTO LINE AND NUMBER	40 3	1276	40		RESULTS OF MONITORING:					
OBJECTIVES			SOILS	OBJECTIVE / PRESCRIPTION:						
			MONITORING	<input type="checkbox"/> YES <input type="checkbox"/> NO						
<b>PLANNED (AERIAL PHOTO)</b> 										
<b>RESULTS OF MONITORING:</b>										
WATERSHED	OBJECTIVE / PRESCRIPTION:		Protect Class II stream channel / maintain 30' buffer along southern boundary.							
MONITORING	<input type="checkbox"/> YES <input type="checkbox"/> NO	PROTECT CLASS II STREAM WATER QUALITY / SPILL YARD & OVERLAP WITH DIRECTIONAL FALCON AND STAIN CLEAN OUT WITHIN 48 HRS								
<b>RESULTS OF MONITORING:</b>										
FISHERIES	OBJECTIVE / PRESCRIPTION:		DK 9/12/165 Diversify fuel timber away from buffer							
MONITORING	<input type="checkbox"/> YES <input type="checkbox"/> NO	SEE ABOVE.								
<b>RESULTS OF MONITORING:</b>										
WILDLIFE	OBJECTIVE / PRESCRIPTION:		See attached. Large units such as this reduce future options and make it difficult to maintain wildlife habitat diversity.							
MONITORING	<input type="checkbox"/> YES <input type="checkbox"/> NO									
<b>RESULTS OF MONITORING:</b>										
VISUAL RECREATION	OBJECTIVE / PRESCRIPTION:		SEE ATTACHED							
MONITORING	<input type="checkbox"/> YES <input type="checkbox"/> NO	Assisted VPO = max modification								
<b>RESULTS OF MONITORING:</b>										
CULTURAL	OBJECTIVE / PRESCRIPTION:		Unit meets assigned VPO							
MONITORING	<input type="checkbox"/> YES <input type="checkbox"/> NO									
<b>RESULTS OF MONITORING:</b>										
LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION:		Fell and yard away from stream bank. Split setting yards away from water in center of unit							
MONITORING	<input type="checkbox"/> YES <input type="checkbox"/> NO									
<b>RESULTS OF MONITORING:</b>										
ROAD LOCATION AND CONSTRUCTION	OBJECTIVE / PRESCRIPTION:		Seasonal use open S1 - 7B1							
MONITORING	<input type="checkbox"/> YES <input type="checkbox"/> NO									
<b>RESULTS OF MONITORING:</b>										
<i>Recreation: See attached</i>										

## 86 - 90 UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED

VCU 210	EIS UNIT # <u>15</u> SEQUENCED # <u>15</u>	FEE'S <u>1355</u> AC:	Vol = <u>3093</u>	PHOTO LINE AND NUMBER <u>40 S 1276</u>	OBJECTIVES																		
SALE NAME <u>APC</u>																							
																							
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="2" style="width: 10%;">RESULTS OF MONITORING:</td> <td colspan="2" style="width: 40%;">SOILS</td> <td colspan="2" style="width: 40%;">OBJECTIVE / PRESCRIPTION:</td> </tr> <tr> <td colspan="2">MONITORING</td> <td colspan="2">YES <input type="checkbox"/> NO <input checked="" type="checkbox"/></td> <td colspan="2"></td> </tr> </table>						RESULTS OF MONITORING:		SOILS		OBJECTIVE / PRESCRIPTION:		MONITORING		YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>									
RESULTS OF MONITORING:		SOILS		OBJECTIVE / PRESCRIPTION:																			
MONITORING		YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>																					
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="2" style="width: 10%;">RESULTS OF MONITORING:</td> <td colspan="2" style="width: 40%;">WATERSHED</td> <td colspan="2" style="width: 40%;">OBJECTIVE / PRESCRIPTION:</td> </tr> <tr> <td colspan="2">MONITORING</td> <td colspan="2">YES <input type="checkbox"/> NO <input checked="" type="checkbox"/></td> <td colspan="2">Protect Class II stream channel integrity within 50' buffer, spot yards. Directionally fall further away from buffer. Ex 9/12/69</td> </tr> </table>						RESULTS OF MONITORING:		WATERSHED		OBJECTIVE / PRESCRIPTION:		MONITORING		YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>		Protect Class II stream channel integrity within 50' buffer, spot yards. Directionally fall further away from buffer. Ex 9/12/69							
RESULTS OF MONITORING:		WATERSHED		OBJECTIVE / PRESCRIPTION:																			
MONITORING		YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>		Protect Class II stream channel integrity within 50' buffer, spot yards. Directionally fall further away from buffer. Ex 9/12/69																			
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RESULTS OF MONITORING:		FISHERIES		OBJECTIVE / PRESCRIPTION:																			
MONITORING		YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>		See above.																			
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="2" style="width: 10%;">RESULTS OF MONITORING:</td> <td colspan="2" style="width: 40%;">WILDLIFE</td> <td colspan="2" style="width: 40%;">OBJECTIVE / PRESCRIPTION (see attached)</td> </tr> <tr> <td colspan="2">MONITORING</td> <td colspan="2">YES <input type="checkbox"/> NO <input checked="" type="checkbox"/></td> <td colspan="2">Large units restrict future options.</td> </tr> </table>						RESULTS OF MONITORING:		WILDLIFE		OBJECTIVE / PRESCRIPTION (see attached)		MONITORING		YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>		Large units restrict future options.							
RESULTS OF MONITORING:		WILDLIFE		OBJECTIVE / PRESCRIPTION (see attached)																			
MONITORING		YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>		Large units restrict future options.																			
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="2" style="width: 10%;">RESULTS OF MONITORING:</td> <td colspan="2" style="width: 40%;">VISUAL RECREATION</td> <td colspan="2" style="width: 40%;">OBJECTIVE / PRESCRIPTION:</td> </tr> <tr> <td colspan="2">MONITORING</td> <td colspan="2">YES <input type="checkbox"/> NO <input checked="" type="checkbox"/></td> <td colspan="2">SEE ATTACHED</td> </tr> </table>						RESULTS OF MONITORING:		VISUAL RECREATION		OBJECTIVE / PRESCRIPTION:		MONITORING		YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>		SEE ATTACHED							
RESULTS OF MONITORING:		VISUAL RECREATION		OBJECTIVE / PRESCRIPTION:																			
MONITORING		YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>		SEE ATTACHED																			
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="2" style="width: 10%;">RESULTS OF MONITORING:</td> <td colspan="2" style="width: 40%;">CULTURAL</td> <td colspan="2" style="width: 40%;">OBJECTIVE / PRESCRIPTION:</td> </tr> <tr> <td colspan="2">MONITORING</td> <td colspan="2">YES <input type="checkbox"/> NO <input checked="" type="checkbox"/></td> <td colspan="2"></td> </tr> </table>						RESULTS OF MONITORING:		CULTURAL		OBJECTIVE / PRESCRIPTION:		MONITORING		YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>									
RESULTS OF MONITORING:		CULTURAL		OBJECTIVE / PRESCRIPTION:																			
MONITORING		YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>																					
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RESULTS OF MONITORING:		LOGGING SYSTEM		OBJECTIVE / PRESCRIPTION:																			
ROAD LOCATION AND CONSTRUCTION		YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>		1/100 yard. Fall and yard away from Stream buffer, Spill if yarding on either side of Stream,																			
MONITORING																							
RESULTS OF MONITORING: <u>Recreational use</u> ROAD LOCATION AND CONSTRUCTION: <u>Open S1 - 7/31</u> MONITORING: <u>NO</u>																							
RESULTS OF MONITORING: <u>Recreational use</u> ROAD LOCATION AND CONSTRUCTION: <u>Open S1 - 7/31</u> MONITORING: <u>NO</u>																							

## 86 - 90 UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED

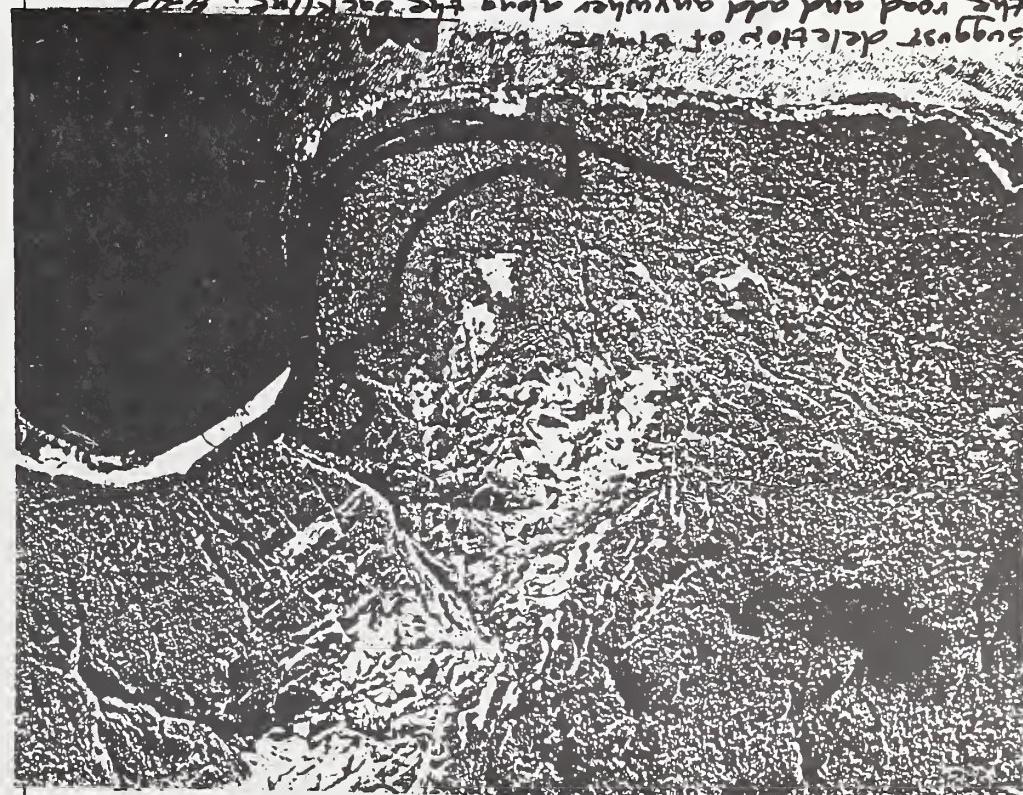
**210** EIS UNIT - 16 SERIALIZED  
**APC** 31 ~~5.5~~ ACRES Vol = 842  
 SALE NAME #11 - 253  
 PHOTO LINE AND NUMBER

## OBJECTIVES

SILVICULTURE	MONITORING	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>
WATERSHED	MONITORING	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>
SHERIES	MONITORING	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>
WILDLIFE	MONITORING	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>
RECREATION	MONITORING	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>
CULTURAL	MONITORING	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>

RESULTS OF MONITORING

OBJECTIVE / PRESCRIPTION:



## RESULTS OF MONITORING:

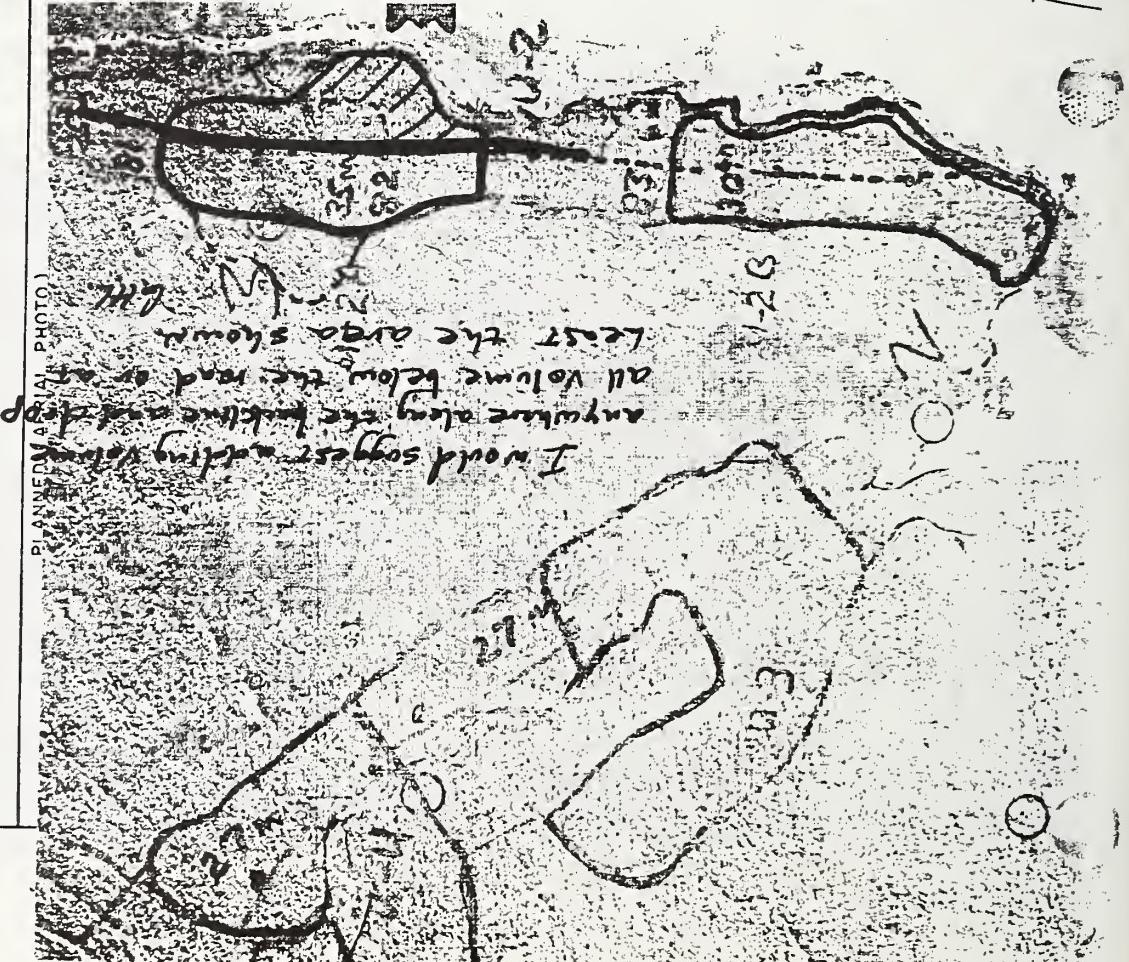
OBJECTIVE / PRESCRIPTION:

Description: See attached J.

RESULTS OF MONITORING:

OBJECTIVE / PRESCRIPTION:

86 - 90 UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED





WATERSHED	No concerns identified	
MONITORING	YES <input type="checkbox"/>	NO <input type="checkbox"/>
RESULTS OF MONITORING:		
FISHERIES	OBJECTIVE / PRESCRIPTION: No concerns identified	
MONITORING	YES <input type="checkbox"/>	NO <input type="checkbox"/>
(see attached)		
RESULTS OF MONITORING: As per field survey dated 9/12/69	OBJECTIVE / PRESCRIPTION: Suggest addition of vulture to the backline if possible to make it more attractive to bald eagles. Best unit size to maintain old growth diversity is 10 acres or less. See item O on checklist.	
MONITORING	YES <input type="checkbox"/>	NO <input type="checkbox"/>
RESULTS OF MONITORING:		
RECREATIONAL	VISUAL OBJECTIVE / PRESCRIPTION: SEE ATTACHED	
MONITORING	YES <input type="checkbox"/>	NO <input type="checkbox"/>
RESULTS OF MONITORING:		
CULTURAL	OBJECTIVE / PRESCRIPTION: Assume VQO MOD Unit meets assigned VQO	
MONITORING	YES <input type="checkbox"/>	NO <input type="checkbox"/>
RESULTS OF MONITORING:		

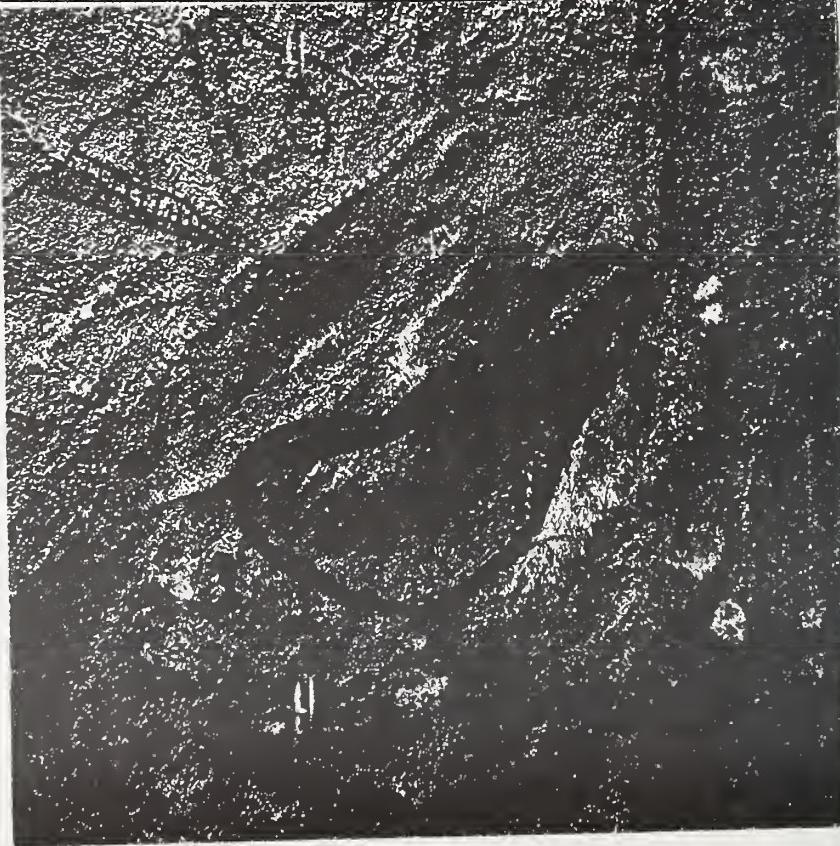
RESULTS OF MONITORING:		OBJECTIVE / PRESCRIPTION:	
LOGGING SYSTEM		Hiland yard	
MONITORING			
YES	<input type="checkbox"/>	NO	<input type="checkbox"/>
RESULTS OF MONITORING:		OBJECTIVE / PRESCRIPTION:	
ROAD LOCATION AND CONSTRUCTION		Closed Public Traffic	
MONITORING			
YES	<input type="checkbox"/>	NO	<input type="checkbox"/>
RESULTS OF MONITORING:			

Location: See Attached

## 81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS.)

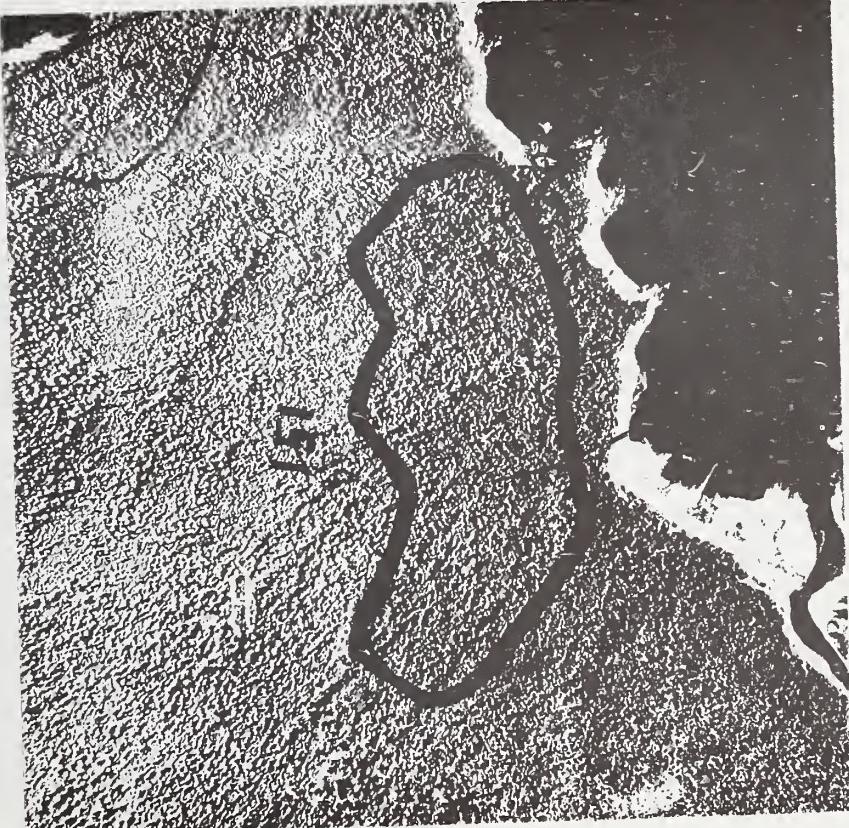
VCU <u>2/10</u>	EIS UNIT # <u>50</u>	ACRES <u>78</u>	LOGGING SYSTEM <u>HL</u>	SILVICULTURE	OBJECTIVE / PRESCRIPTION: Clearcut followed by natural regeneration. This is a medium productivity site (site 82 average). Stand is mostly low risk even age resulting from blowdown. Bluff on east side of knob in middle of unit is very steep and will require full suspension to minimize stump pulling and soil disturbance. Retain a snags per acre in old growth portion of unit (NE portion) and others in young growth as possible.
STAND # <u>1</u>	VOLUME FEIS <u>124B</u>	VOLUME CRUISE <u>—</u>	SOILS	HIGH HAZARD AREA	OBJECTIVE / PRESCRIPTION: <u>East unit over steep. Need field review.</u>
SALE NAME <u>AA 03</u>	PHOTO LINE AND NUMBER <u>403-46</u>	BRING BOUNDARIES TO WILDCAT DESIGN	RESULTS OF MONITORING:	REW <u>9/89</u>	
<b>OBJECTIVES</b> Provide volume for the 86-90 operating period.				ROAD LOCATION AND OBJECTIVE	CLOSED ROAD — OPEN ROAD — OBJECTIVE / PRESCRIPTION: <u>Block R1 Minus to Game Closed</u>
PLANNED (ORTHO PHOTO)				SCALE: <u>—</u>	

FISHERIES / HYDROLOGY	CLASS I CROSSING	CLASS II CROSSING	CLASS III CROSSING
FMNU <u>II</u>	TEMPERATURE SENSITIVITY: YES	NO	NO
OBJECTIVE / PRESCRIPTION: Protect stream channels. Establish zone within unit margin 50' off stream along boundary with buffer. See R100 403-46. Functionally fall timber away from buffer 9/12/89.			
WILDLIFE	IN HABITAT FOR OLD GROWTH SPECIES <u>No</u> (See attached)		
OBJECTIVE / PRESCRIPTION: Removal of sound blow down will improve wildlife access to forage resulting from harvest.			
VISUAL RECREATION	Best to do a commercial thinning <u>SEE ATTACHED</u> Assured VPO = MAX MOD		
Unit meets assigned VPO			
CULTURAL	KNOWN SITE	PROBABILITY ZONE: HIGH — MEDIUM —	
LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION: Hi Tack yard, Fall or log yard away from stream buffer		
REMARKS: Recreation: See attached			



## 81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)

YCU	210	EIS UNIT #	<u>151</u>	ACRES	<u>85</u>	LOGGING SYSTEM	<u>H/C</u>	SILVICULTURE	OBJECTIVE / PRESCRIPTION: C (Leave in a unit followed by natural regeneration). This is a highly productive site w/t a river side ridge of 92' (ftm). No commercially thin at age 12-18 yrs. with wildlife emphasis. Regain an acre or 2 storage for diversity.
STAND #		VOLUME FEES	<u>2261</u>	VOLUME CRUISE					
SALE NAME	<u>AB 03</u>								
PHOTO LINE AND NUMBER									
OBJECTIVES	Provide volume for the 86-90 operating period								
		SOILS	HIGH HAZARD AREA	OBJECTIVE / PRESCRIPTION:					
				lack of deflection will cause serious soil scour/fatigue.					
				RW 9/89					
RESULTS OF MONITORING:	ROAD LOCATION	CLOSED ROAD — OPEN ROAD —	OBJECTIVE / PRESCRIPTION:						
PLANNED (ORTHO PHOTO)	SCALE:	Seasonal (see Open S/I Through 7/31)							
FISHERIES / HYDROLOGY	CLASS I CROSSING	CLASS II. CROSSING	CLASS III CROSSING						
OBJECTIVE / PRESCRIPTION:	FHMU	TEMPERATURE	SENSITIVITY: YES NO						
WILDLIFE	IN HABITAT FOR OLD GROWTH SPECIES Yes (See attached) 85ac. Due to objective / prescription. This unit is located in a old growth, very sensitive area. Best unit size in deer winter range habitat is less than 40 acres with an average of buffer 10ac. Best mitigation is described in item D on wildlife check sheet. Vehicle access is a big concern because								
RECREATION	VISUAL OBJECTIVE / PRESCRIPTION: SC ATTRACTED OF connection with other areas. Ass/alter up to = MODIFICATION								
CULTURAL	KNOWN SITE	PROBABILITY ZONE:	HIGH — MEDIUM —						
LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION:	High lead yard							
REMARKS:	Recreation: See Attached								



PLANNED (AS PER 81 - 90 SEIS) LOCATION CARD - AVANT AND ROAD CEIS UNIT 20 20 TR /

VUL EIS UNIT # <u>156</u> ACRES <u>55</u> LOGGING SYSTEM <u>H/L</u>							SILVICULTURE OBJECTIVE / PRESCRIPTION: Natural regeneration. This is a medium productivity site with Fair site index of 83. This unit is low risk timber of blonderum origin. Retain an average of 2 snags per acre for diversity if possible.	
STAND #	VOLUME FEES	VOLUME CRUISE	ROAD LOCATION	CLOSED ROAD	OPEN ROAD	RESULTS OF MONITORING:	OBJECTIVE / PRESCRIPTION: Block to vehicle traffic	
SALE NAME <u>AA 03</u>	PHOTO LINE AND NUMBER <u>3913-87</u>	SOILS HIGH HAZARD AREA						
OBJECTIVES Provide volume for the 86-90 operations period.							OBJECTIVE / PRESCRIPTION: See attached	
PLANNED (ORTHO PHOTO)			SCALE :	FISHERIES / HYDROLOGY		CLASS I CROSSING — CLASS II CROSSING — CLASS III CROSSING — FHMU <u>III</u> TEMPERATURE SENSITIVITY: YES — NO <u>L</u> OBJECTIVE / PRESCRIPTION: Protect <u>CLASS III</u> WATER Quality, 2 V-NATURALS w/in <u>100' of channel</u> . DIRECTIONAL FALLLINE AWAY FROM CHANNELS, DO NOT LOG SLASH CLEAN CUT WITH 45 HRS. See DRAFT 3913-B-F DK 9/12/85		
				WILDLIFE		IN HABITAT FOR OLD GROWTH SPECIES <u>No</u> (see attached) OBJECTIVE / PRESCRIPTION: O.K. with silvicultural Rx. Best to do a commercial thin.		
				VISUAL RECREATION		OBJECTIVE / PRESCRIPTION: SEE ATTACHED Assessments VPO = MAX WLD Wind meets assigned VPO		
				CULTURAL		KNOWN SITE	PROBABILITY ZONE : HIGH — MEDIUM —	OBJECTIVE / PRESCRIPTION:
				LOGGING SYSTEM		OBJECTIVE / PRESCRIPTION: If/lead yard, split yard ✓ no fakes. Fall at yard away from n slope		
						REMARKS: See attached		

# 81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)

VCU	EIS UNIT #	ACRES	LOGGING SYSTEM	SILVICULTURE	OBJECTIVE / PRESCRIPTION: Clear cut harvest followed with natural regeneration. This is a primary cut site (high yield). A site is denoted by a circle of 91' (R=4.5m). Monitor re-generation and pre-commercial thinning with a timber purchase. Retain can over 25% gees per acre for diversity. Strengthen forest health between units 1 and 2. Sub-prime timber on Unit 3 boundary.		
211	1	43	43	688	VOLUME CRUISE	—	
STAND #	VOLUME FEIS	688	VOLUME CRUISE	—			
SALE NAME	H4 03						
PHOTO LINE AND NUMBER	40B - 1276-49						
<b>OBJECTIVES</b> Provide volume for the 86-90 operating				SOILS HIGH HAZARD AREA — Protect V-notch cut area of unit boundary. Do other soils concerns			
				OBJECTIVE / PRESCRIPTION: 12/20 9/89			
				RESULTS OF MONITORING:			
		ROAD LOCATION AND OBJECTIVE		CLOSED ROAD	OPEN ROAD	OBJECTIVE / PRESCRIPTION: Block All cuts to Grouse Class	
				CLASS I CROSSING	CLASS II CROSSING	CLASS III CROSSING	
				FHMU	TEMPERATURE SENSITIVITY	No cut through timber.	
				CAPABILITY	Maintain Resident Fish Habitat	No cut from buffer.	
				Class II Stream	Put 50' Buffer adjacent to	50' 9/89	
				WILDLIFE	In habitat for old growth species	No (See attached)	
				OBJECTIVE / PRESCRIPTION: Good silvicultural Rx. See photo for boundary change			
				VISUAL RECREATION	SEE ATTACHED	OBJECTIVE / PRESCRIPTION: Assisted up to Modification Unit meet assigned	
				CULTURAL	KNOWN SITE	PROBABILITY ZONE: HIGH — MEDIUM — OBJECTIVE / PRESCRIPTION: Logging System	
				OBJECTIVE / PRESCRIPTION: 1/5/ lead yard, fell and yard away from no tel.			
				REMARKS: Recreation See attachment.			



**81 - 90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81 - 90 SEIS)**

VCU 211	EIS UNIT # <u>2</u>	ACRES <u>60</u>	LOGGING SYSTEM <u>I/L</u>	SILVICULTURE OBJECTIVE / PRESCRIPTION: Clearcut harvest proposed with partial thinning operation (Sitta species) due to moderate stand age. This unit has good potential for regeneration (80-91) with an average site index of 88 (Farr). Retain all areas of 2 snags per acre for diversity.
STAND #	VOLUME FEES <u>1596</u>	VOLUME CRUISE <u>—</u>	SALE NAME <u>H A O 3</u>	PHOTO LINE AND NUMBER <u>40B 1276 49</u>
OBJECTIVES Provide volume for the 86-90 operating period.				SOILS OBJECTIVE / PRESCRIPTION: Protect hill yard East + $\frac{1}{2}$ of west. can cause PW 9/89
				RESULTS OF MONITORING: ROAD LOCATION CLOSED ROAD — OPEN ROAD — OBJECTIVE / PRESCRIPTION: ROAD AND OBJECTIVE Black Alrens to grass closed
PLANNED (ORTHO PHOTO) SCALE: <u>—</u>				FISHERIES / CLASS I CROSSING — CLASS II CROSSING — CLASS III CROSSING — HYDROLOGY FHMU — TEMPERATURE SENSITIVITY: YES — NO — OBJECTIVE / PRESCRIPTION: NO CONCERN'S IDENTIFIED, FIELD SURV 7/37
				WILDLIFE IN HABITAT FOR OLD GROWTH SPECIES <u>NO</u> (see attached)
<p><i>Good unit configuration</i></p> 				
				VISUAL RECREATION OBJECTIVE / PRESCRIPTION: SEE ATTACHMENT
				CULTURAL KNOWN SITE — PROBABILITY ZONE: HIGH — MEDIUM — OBJECTIVE / PRESCRIPTION:
				LOGGING SYSTEM OBJECTIVE / PRESCRIPTION: Hill end yard fell and yard any from V notch and Stream 60m
				REMARKS <u>Location; See Attached</u>

UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)

VCU 211 EIS UNIT # 21 ACRES 80 LOGGING SYSTEM H/L  
 STAND # — VOLUME FEIS 1280 VOLUME CRUISE —  
 SALE NAME H/H 03 PHOTO LINE AND NUMBER 40B 1276-49

## OBJECTIVES

PLANNED (ORTHO PHOTO)

AD LOCATION CARD - PLANNED (AS PER OR-32)	
SILVICULTURE	OBJECTIVE / PRESCRIPTION: prevent following big blowdowns which makes it unsuitable (unsuccessful). Since we have wet cut areas with significant recruitment regeneration very slowly and plantings are not adequate a 3rd objective allocation is not adequate as it is still too early to evaluate what corrective measures are needed stand age and stand size for diversity.
SOILS	OBJECTIVE / PRESCRIPTION: maintain multiple blind roads, 12' shoulder, 12' wide shoulder to main fall line, no slope loadings to main fall line, no soil loss. BW 7/37
RESULTS OF MONITORING:	CLOSED ROAD — OPEN ROAD — OBJECTIVE / PRESCRIPTION: Seasonal use open 5/1 - 7/31
ROAD LOCATION AND OBJECTIVE	CLASS I CROSSING — CLASS II CROSSING — CLASS III CROSSING — FHMU TEMPERATURE SENSITIVITY: YES — NO — OBJECTIVE / PRESCRIPTION: MAINTAIN CLASS III WAITER GROWTH SPLIT VATED CHANNELS AND YARD ALLOWED PONDS AND WETLANDS. AS Channel Type. SJ N 7/37 IN HABITAT FOR OLD GROWTH SPECIES NO (see attached)
WILDLIFE	OBJECTIVE / PRESCRIPTION: Monitoring of regeneration in this low productive site is also important for wildlife value info.
RECREATION	VISUAL OBJECTIVE / PRESCRIPTION RECREATIONAL MODIFICATIONS: Windbreak established.
CULTURAL	KNOWN SITE — PROBABILITY ZONE: HIGH — MEDIUM — OBJECTIVE / PRESCRIPTION:
LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION: High lead year, low snags / poor species, need to be isolated to reduce post set by gf blind leads.
REMARKS:	None

LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)

VCU <u>211</u>	EIS UNIT # <u>5</u>	ACRES <u>63</u>	LOGGING SYSTEM <u>HL</u>	SILVICULTURE At ages 12-18 precommercial thinning with a thinning emphasis. Retain an area of 20% snags per acre for diversity.	OBJECTIVE / PRESCRIPTION: Concerns followed by objectives at this location. There is a major problem (Fair or Poor) in this area.
STAND # <u> </u>	VOLUME FEIS <u>1676</u>	VOLUME CRUISE <u> </u>			
SALE NAME <u>PA 03</u>					
PHOTO LINE AND NUMBER <u> </u>					
OBJECTIVES <u>Provide habitat for deer, moose, grouse, ptarmigan, etc.</u>					
PLANNED (ORTHO PHOTO)				SCALE: <u> </u>	RESULTS OF MONITORING: ROAD LOCATION AND OBJECTIVE CLOSED ROAD — OPEN ROAD — OBJECTIVE / PRESCRIPTION: Seasonal use open 5/1 — 7/31
					FISHERIES / HYDROLOGY CLASS I CROSSING <u> </u> FHMU <u> </u> TEMPERATURE SENSITIVITY: YES <u> </u> NO <u> </u> OBJECTIVE / PRESCRIPTION:
					WILDLIFE IN HABITAT FOR OLD GROWTH SPECIES <u>No (see attached)</u> OBJECTIVE / PRESCRIPTION:
					CONCERN'S IDENTIFIED <u>9/6/9 St J.</u>
					This unit is located just above deer winter range.
					VISUAL RECREATION SEE ATTACHED Known Site <u>WPO</u> = Indication CULTURAL Known Site <u> </u> PROBABILITY ZONE: HIGH <u> </u> MEDIUM <u> </u> OBJECTIVE / PRESCRIPTION:
					LOGGING SYSTEM Known Site <u> </u> PROBSCRIPTION: Head cut and timber cutting be done in + to locate small trees.
					REMARKS <u> </u>



# 81 - 90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)

VCU	<u>211</u>	EIS UNIT	<u>*150</u>	ACRES	<u>87</u>	LOGGING SYSTEM	<u>H/L</u>	SILVICULTURE	OBJECTIVE / PRESCRIPTION:
STAND *		VOLUME FEIS	<u>2314</u>	VOLUME CRUISE		FISHERIES / HYDROLOGY	CLASS I CROSSING — FHMU —	CLASS II CROSSING — TEMPERATURE SENSITIVITY: YES ____ NO ____	CLASS III CROSSING —
SALE NAME	<u>HH O3</u>	PHOTO LINE AND NUMBER	<u>47</u>	464-7	OBJECTIVE / PRESCRIPTION:	No CONCERN'S IDENTIFIED			
OBJECTIVES	PROVIDE alternate routes for the 56-57 crossings								SEE ATTACHED
								RESULTS OF MONITORING:	
ROAD LOCATION AND OBJECTIVE		ROAD LOCATION AND OBJECTIVE		ROAD LOCATION AND OBJECTIVE		ROAD LOCATION AND OBJECTIVE		ROAD LOCATION AND OBJECTIVE	
OPEN ROAD — Sea Sonal usc opens		OPEN ROAD — Sea Sonal usc opens		OPEN ROAD — Sea Sonal usc opens		OPEN ROAD — Sea Sonal usc opens		OPEN ROAD — Sea Sonal usc opens	
								KNOWN SITE	PROBABILITY ZONE: HIGH — MEDIUM —
								OBJECTIVE / PRESCRIPTION:	SEE ATTACHED
								LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION: H/H and V/H, Some L/H and Apple trees to meet designed vige
								REMARKS	

5E15 3

## 86-90 UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 86-90 FEIS)

VCU <u>212</u>	EIS UNIT # <u>3</u>	ACRES <u>40.35</u>	APC <u>36</u>	LOGGING SYSTEM <u>A</u>	SILVICULTURE	OBJECTIVE / PRESCRIPTION:	
STAND #	VOLUME FEIS	<u>581</u>	VOLUME CRUISE				
SALE NAME	APC	86-90					
PHOTO LINE AND NUMBER	<u>41</u>	<u>176</u>	<u>356</u>				
OBJECTIVES	Eagle Nest and/or Raptor Unk! Drop NW. portion of unit + leave S. S. ground Eagle nest and/or raptor unkn!					NO SOIL CONCERN IDENTIFIED	HIGH HAZARD AREA
RESULTS OF MONITORING:						OBJECTIVE / PRESCRIPTION:	
ROAD LOCATION AND OBJECTIVE	CLOSED ROAD	OPEN ROAD	CLOSED ROAD	OPEN ROAD	CLOSED ROAD	OBJECTIVE / PRESCRIPTION:	
FISHERIES / HYDROLOGY	CLASS I CROSSING <input checked="" type="checkbox"/>	CLASS II CROSSING <input type="checkbox"/>	CLASS III CROSSING <input type="checkbox"/>				
OBJECTIVE / PRESCRIPTION:	FMHU <input checked="" type="checkbox"/>	TEMPERATURE SENSITIVITY: YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>				
WILDLIFE	IN HABITAT FOR OLD GROWTH SPECIES <input checked="" type="checkbox"/> (see attached) or less.					35 ac. ea. Dwpt. of 10 acres group	
ENTIRE UNIT WITHIN RENTION HABITAT (OUR) & ENCL 80 & 2 CAY/ TREES, HOWEVER, IDT DID NOT NOTE ANY WILDLIFE ON CARS							
VISUAL RECREATION						With intent of beach trail and trails Assessment VQO of Modification. Site to protect O	
CULTURAL	KNOWN SITE <input type="checkbox"/>					PROBABILITY ZONE: HIGH <input type="checkbox"/> MEDIUM <input checked="" type="checkbox"/>	
LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION: <u>1/4, con grad</u>						
REMARKS						REMARKS: <u>None</u>	



5E154

86 - 90 UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED ( AS PER 86-90 FEIS )

VOL 212	EIS UNIT # 4	ACRES 75	APC Logging System	SILVICULTURE	OBJECTIVE / PRESCRIPTION: Clearcut followed by natural regeneration. All downed logs high side productivity. Age sick is 85 (Years). Monitored in trail. 86-90 with wildlife analysis. Retain an ave. of 2 acreage per acre for diversity.
STAND #	VOLUME FEIS 1938	VOLUME CRUISE —		SOILS	Logging systems - L-type and ground cuts for edge pop -
SALE NAME	APC 86-90	40 B 1376 40	HIGH HAZARD AREA —	OBJECTIVE / PRESCRIPTION:	
PHOTO LINE AND NUMBER	No soil hazard concern identified.				
OBJECTIVES	Cutting unit with private land should be surveyed. Cut to private line.				
				RESULTS OF MONITORING:	ROAD LOCATION CLOSED ROAD — OPEN ROAD — OBJECTIVE / PRESCRIPTION: Close to Public Vehicle Access
				FISHERIES / HYDROLOGY	CLASS I CROSSING — CLASS II CROSSING — CLASS III CROSSING — FHMU <input checked="" type="checkbox"/> TEMPERATURE SENSITIVITY: YES <input checked="" type="checkbox"/> NO OBJECTIVE / PRESCRIPTION: No concerns identified.
				WILDLIFE	IN HABITAT FOR OLD GROWTH SPECIES <input checked="" type="checkbox"/> (see attached) OBJECTIVE / PRESCRIPTION: unit within deer retention habitat. Best unit size in deer winter range is 10 acres or less to maintain old growth habitat values.
				RECREATION	Visual Objective / PRESCRIPTION: Unit meets assigned % of Modification
				CULTURAL	Known Site — Probability Zone : HIGH — MEDIUM — OBJECTIVE / PRESCRIPTION :
				LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION: Head yard.
				REMARKS	Retention: See Attached
					
PLANNED (AERIAL PHOTO) SCALE: 15840					

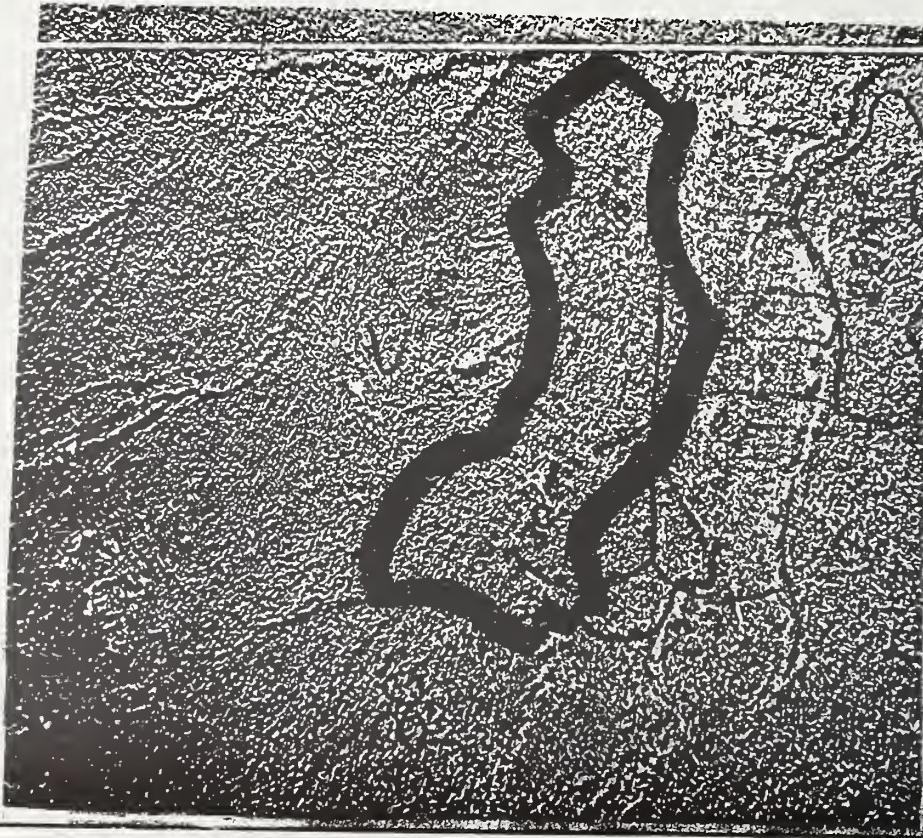
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## 86 - 90 UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED ( AS PER 86-90 FEIS )

UNIT #	EIS UNIT #	5	ACRES	117	APC 5 GPP LOGGING SYSTEM
STAND #	VOLUME FEIS	2385	VOLUME CRUISE	—	
SALE NAME	APC	86-90			
PHOTO LINE AND NUMBER	40B	1376	40		

OBJECTIVES: Drop in SW corner to reduce unit size.

PLANNED (AERIAL PHOTO) SCALE: 15840



SILVICULTURE	OBJECTIVE / PRESCRIPTION: Clearcut & harvest followed by natural regeneration. On 5/21/86 is an opportunity to plant seed (see soil map). This is a high productivity area. Average dbh under 90. PFT stages 12-18 yrs worth a timber analysis. Retain approx 2 trees/acre for diversity. Substitute timber on southwest corner for timber. Cost to clearcut is per acre. See plan No 40B-1276-40
SOILS	HIGH HAZARD AREA — OBJECTIVE / PRESCRIPTION:

RESULTS OF MONITORING:	CLOSED ROAD — OPEN ROAD — OBJECTIVE / PRESCRIPTION: <b>Closes to Public vehicle access</b>
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FISHERIES / HYDROLOGY	CLASS I CROSSING — CLASS II CROSSING — CLASS III CROSSING — FHMU # TEMPERATURE SENSITIVITY: YES — NO — OBJECTIVE / PRESCRIPTION: No concerns identified.
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WILDLIFE	IN HABITAT FOR OLD GROWTH SPECIES <b>NO</b> (See attached) OBJECTIVE / PRESCRIPTION: Unit is adjacent to Deer winter range and riparian habitat.
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VISUAL RECREATION	OBJECTIVE / PRESCRIPTION: Unit meets Assigned VPO of Maximum Modification <b>SEE ATTACHED</b>
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CULTURAL	KNOWN SITE — PROBABILITY ZONE: HIGH — MEDIUM — OBJECTIVE / PRESCRIPTION:
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LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION: High lead yard fall and yield away from no tail on east side of unit.
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REMARKS	Recreation: See attached
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Section 6

## 86-90 UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 86-90 FEIS)

FEIS UNIT # <u>6</u>	ACRES <u>.55</u>	APT & SUP LOGGING SYSTEM	SILVICULTURE OBJECTIVE / PRESCRIPTION: Clear cut Planned for closure of highly productive site. Monitor regeneration. & PC7 at age 12-18 with a future emphasis. Retain an average of 2 trees per acre for diversity.
VOLUME FEIS <u>1378</u>	VOLUME CRUISE —	SOILS HIGH HAZARD AREA	OBJECTIVE / PRESCRIPTION:
ACR 86-90	ACR 39B	476 80	Soil hazard concern on north tip of unit.
RESULTS OF MONITORING: ROAD LOCATION AND OBJECTIVE CLOSED ROAD — OPEN ROAD — OBJECTIVE / PRESCRIPTION: Closed to Public vehicle access			
FISHERIES / HYDROLOGY FHMU A CLASS I CROSSING — CLASS II CROSSING — CLASS III CROSSING — TEMPERATURE SENSITIVITY: YES <u>NO</u> OBJECTIVE / PRESCRIPTION: Stream near south boundary is Class A stream. Channel bisecting unit; class C stream. Hydro review.			
WILDLIFE IN HABITAT FOR OLD GROWTH SPECIES <u>NO</u> (see attached) VISUAL RECREATION Unit needs Assess V/QO of Maximum Modification SEE ATTACHED			
CULTURAL KNOWN SITE PROBABILITY ZONE: HIGH <u>MEDIUM</u> OBJECTIVE / PRESCRIPTION:			
LOGGING SYSTEM OBJECTIVE / PRESCRIPTION: H/leads yard. Fell and yard away from stream channels			
REMARKS May be isolating timber above bank line.			
Perception: See Attached			

Planned (Aerial Photo) Scale 1:8400  
CN ~ 39B 02220 4

SE 157

## 86 - 90 UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 86-90 FEIS)

VCU <u>212</u>	EIS UNIT # <u>7</u>	ACRES <u>.70</u>	LOGGING SYSTEM <u>HPC</u>	SILVICULTURE <u>(Site under 100 year natural regeneration. This is a highly productive area on slopes &lt; 20%. Retain regeneration and protect areas 12-15 yrs. until timber matures. Retain an acre of 2 snags per acre for diversity.)</u>
STAND # <u>—</u>	VOLUME FEIS <u>1862</u>	VOLUME CRUISE <u>—</u>		
SALE NAME <u>AFC</u>	SALE # <u>86-90</u>	BENTO LINE AND NUMBER <u>39 B 476 - 80</u>		
OBJECTIVES				
<p><b>SOILS</b> HIGH HAZARD AREA — OBJECTIVE / PRESCRIPTION: Soil hazard concern on Northeast boundary of unit along Cypress Creek.</p> <p><b>RESULTS OF MONITORING:</b> ROAD LOCATION <u>CLOSED ROAD</u> — OPEN ROAD <u>—</u> OBJECTIVE / PRESCRIPTION: <u>Block Allows to grass close</u></p>				
<p><b>FISHERIES / HYDROLOGY</b> CLASS I CROSSING <u>—</u> CLASS II CROSSING <u>—</u> CLASS III CROSSING <u>—</u> FHMU <u>A</u> TEMPERATURE SENSITIVITY: YES <u>—</u> NO <u>—</u></p> <p>OBJECTIVE / PRESCRIPTION: Stream along northern boundary and tributary eastern portion of unit; class A protection. Fish / Hydro review. Road crosses two class C lots.</p>				
<p><b>WILDLIFE</b> IN HABITAT FOR OLD GROWTH SPECIES <u>NO</u> (see attached)</p> <p><b>NO CONCERN identified</b></p>				
<p><b>VISUAL RECREATION</b> OBJECTIVE / PRESCRIPTION: Unit meets assigned VQO of Maximum Modification <u>SEE ATTACHED</u></p>				
<p><b>CULTURAL</b> KNOWN SITE <u>—</u> PROBABILITY ZONE : HIGH — MEDIUM — OBJECTIVE / PRESCRIPTION:</p>				
<p><b>LOGGING SYSTEM</b> OBJECTIVE / PRESCRIPTION: High yield, Field road away from stream and no tales</p>				
<p><b>REMARKS</b> Recreation: See attached</p>				



5E15 8

86 - 90 UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 86-90 FEIS)	
YARD 212	EIS UNIT # 8
STAND	ACRES 10.2 52 ADC 8 SYSTEM
VOLUME FEIS	2067' 1054' VOLUME CRUISE
SALE NAME	ARC 86-90
PHOTO LINE AND NUMBER	398 476 80
OBJECTIVES: Pick up NE corner of unit with Grahamki (Long line) It is not feasible drop the SE setting ( ) drop if not feasible	
PLANNED (AERIAL PHOTO) Complete suspension over creek. (Disagreed) SCALE: 15840	
	
SILVICULTURE	OBJECTIVE / PRESCRIPTION: Clearcut in areas not following natural regeneration. This is a high site. (Site index 100') Retain at ages 12'-18' yrs with future emphasis on a mix of 2 stages per acre for diversity. Possible Substitution on east & west side of units for steep ground deletion See photo 393.
SOILS	HIGH HAZARD AREA _____ OBJECTIVE / PRESCRIPTION:
RESULTS OF MONITORING: ROAD LOCATION AND OBJECTIVE	
CLOSED ROAD	OPEN ROAD — OBJECTIVE / PRESCRIPTION: Closed to Public Vehicles Access SS
FISHERIES / HYDROLOGY	CLASS I CROSSING ____ CLASS II CROSSING <u>✓</u> FHMU <u>✓</u> TEMPERATURE SENSITIVITY: YES — NO <u>✓</u> OBJECTIVE / PRESCRIPTION: Class C crossing ( ) Stream thru center of unit Class C. Hydro review needed. Split by grading away from stream, or complete suspension.
WILDLIFE	IN HABITAT FOR OLD GROWTH SPECIES <u>✓</u> NO (see attached) OBJECTIVE / PRESCRIPTION: A 100' buffer on each side of the creek will protect riparian habitat values. Retain snags in small gullies near stream course. NO Identified Concerns
VISUAL RECREATION	OBJECTIVE / PRESCRIPTION: Unit meets Assigned VQO of Modification See Attached
CULTURAL	KNOWN SITE _____ PROBABILITY ZONE: HIGH — MEDIUM — OBJECTIVE / PRESCRIPTION:
LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION: Hillside yard. Split yard away from Stream
REMARKS: May be possible to spur on north side of creek.	

Recreation: See Attached

SES 9.

## 86 - 90 UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 86-90 FEIS)

VOL 212	EIS UNIT # 9	ACRES <u>17.70</u>	LOGGING SYSTEM <u>H</u>	SILVICULTURE REGROWTH: Monitor regeneration and precommercial thinning at age 12-18 yrs with a timber emphasis. Retain an average of 25 m <sup>3</sup> /ha per acre diversity. Subtropical portion of unit may provide short term grazing opportunity.	OBJECTIVE / PRESCRIPTION: Clean cut harvested by a stand regeneration. This is a high productivity area (Farr 50-100).
STAND #	VOLUME FEIS	1830	VOLUME CRUISE		
SALE NAME	APC	86-90			
PHOTO LINE AND NUMBER	38B	476 - 104			
OBJECTIVES	Split settings on creek				Soil hazard concern identified in 95% of unit.
					Soil hazard concern identified in 95% of unit.
RESULTS OF MONITORING:					
ROAD LOCATION AND OBJECTIVE		CLOSED ROAD — OPEN ROAD —	OBJECTIVE / PRESCRIPTION: Closed to Public Vehicle Traffic		
FISHERIES / HYDROLOGY		CLASS I CROSSING — CLASS II CROSSING — CLASS III CROSSING ✓			
OBJECTIVE / PRESCRIPTION:		FHMU TEMPERATURE SENSITIVITY: YES — NO ✓			
		Class C crossing on road from unit 8. Hydro review.			
WILDLIFE		IN HABITAT FOR OLD GROWTH SPECIES <u>A10</u> (see attached)	OBJECTIVE / PRESCRIPTION:		
VISUAL RECREATION		No identified concerns	OBJECTIVE / PRESCRIPTION:		
CULTURAL		Unit meets VQO & Modification ✓ SEE ATTACHED	KNOWN SITE PROBABILITY ZONE: HIGH — MEDIUM — OBJECTIVE / PRESCRIPTION:		
LOGGING SYSTEM		Objective / Prescription: 1/1000 yds. Fall and yard away from stream.			REMARKS: See Attached

SET 5 10

## 86-90 UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 86-90 FEIS)

VCU 212 EIS UNIT # 10 : ACRES 113 APP LOGGING SYSTEM  
 STAND # VOLUME FEIS 2889 VOLUME CRUISE  
 SALE NAME APN 86-90  
 PHOTO LINE AND NUMBER 39 B 476-80

OBJECTIVES Leave 100' along creek.

PLANNED (AERIAL PHOTO) SCALE: 15840



VCU 212	EIS UNIT # 10	ACRES 113	APP LOGGING SYSTEM	SILVICULTURE	OBJECTIVE / PRESCRIPTION: Clear cut followed by natural regeneration. Share yarding opportunity on slopes ≤ 20%. This is a high site (Favor 100). Retain all are, of 2 snags per acre for diversity.
STAND #	VOLUME FEIS	2889	VOLUME CRUISE		
SALE NAME	APN	86-90			
PHOTO LINE AND NUMBER	39 B	476-80			
SOILS	HIGH HAZARD AREA	—	OBJECTIVE / PRESCRIPTION:		
	Soil hazard concern identified in northern tip of unit boundary.	—			
RESULTS OF MONITORING:	—	—			
ROAD LOCATION AND OBJECTIVE	CLOSED ROAD — OPEN ROAD	—	OBJECTIVE / PRESCRIPTION:		
	Closed to Public Vehicle Access	—			
FISHERIES / HYDROLOGY	CLASS I CROSSING ✓ CLASS II CROSSING —	CLASS III CROSSING —	FRNU A TEMPERATURE SENSITIVITY YES NO	NO	
	Spur from main road into stream on north boundary implements class A prescription. Fish/Hydro review.				
WILDLIFE	IN HABITAT FOR OLD GROWTH SPECIES NO	(See attached)	OBJECTIVE / PRESCRIPTION:		
	The bottom of the unit extends down into riparian habitat.				
NO CONCERN	NO CONCERN	RECREATION	OBJECTIVE / PRESCRIPTION:		
VISUAL RECREATION	SEE ATTACHED				
CULTURAL	KNOWN SITE	PROBABILITY ZONE : HIGH — MEDIUM —	OBJECTIVE / PRESCRIPTION :		
LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION: Hill end yard. Fell and yard away from stream				
REMARKS	Excavation; See Attached				

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## 86 - 90 UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 86-90 FEIS)

VAL 212	EIS UNIT # <u>12</u>	ACRES <u>19</u>	LOGGING SYSTEM <u>H</u>	SILVICULTURE OBJECTIVE / PRESCRIPTION: Consider deleting on west side & adding volume on east side if possible. G.L.
STAND # <u>1</u>	VOLUME FEIS <u>522</u>	VOLUME CRUISE —	<i>Cheatnut forest regenerated by natural regeneration. This is a Fair site in the 100' (or longer) production stand. Good tree cover on even aged stand. Risk of North and East. PCT of age 12-18 yrs. with wildlife emphasis. Retain 2 snags per acre for diversity. Possible addition on west side to substitute for unit. Addition on South of unit.</i>	
SITE NAME <u>APC 86-90</u>	PHOTO LINE AND NUMBER <u>41 176 355</u>	SOILS HIGH HAZARD AREA —	OBJECTIVE / PRESCRIPTION:	
OBJECTIVES				
RESULTS OF MONITORING: ROAD LOCATION AND OBJECTIVE CLOSED ROAD — OPEN ROAD — OBJECTIVE / PRESCRIPTION: <i>Closed to Public Vehicle Access</i>				
FISHERIES / HYDROLOGY CLASS I CROSSING — CLASS II CROSSING — CLASS III CROSSING — FHMU/ <u>No</u> TEMPERATURE SENSITIVITY: YES — NO —				
OBJECTIVE / PRESCRIPTION: No concerns identified.				
WILDLIFE IN HABITAT FOR OLD GROWTH SPECIES <u>HES</u> (See attached) OBJECTIVE / PRESCRIPTION: Best unit size is 10 acres or less in deer winter range. 19 ac. ea. piece of growth, 1/5 ac. estuary buffer				
<i>All concerns were identified but is fair to both habitats</i>				
VISUAL RECREATION Retention of beach front helps unit meet Assured VRO of Modification SEE ATTACHED				
CULTURAL KNOWN SITE — PROBABILITY ZONE: HIGH — MEDIUM — OBJECTIVE / PRESCRIPTION:				
LOGGING SYSTEM OBJECTIVE / PRESCRIPTION: Hill end yard				
REMARKS <i>Recreation: See Attached Potential recreation site at first bridge site on Wukelook Creek.</i>				



SE 15 13 or 13D

86 - 90' UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 86-90 FEIS)

123	EIS UNIT #	13	ACRES	<del>2X</del> 69	LOGGING SYSTEM	SILVICULTURE	OBJECTIVE / PRESCRIPTION:
740	VOLUME	FEIS	278/60	VOLUME CRUISE		This is a highly productive area (Farr S. Index/00). PCP at app 12-18 yrs with a mostly large basal. Retain an ave. of 2 snags per acre for diversity; Substitute on both boundary units taking old growth to replace volume lost on NE corner of unit along the elevation slopes.	
SALE NAME	APC	86-90					
PHOTO LINE AND NUMBER	41	176	255				
OBJECTIVES							
SOILS							
Hazard Area _____							
OBJECTIVE / PRESCRIPTION:							
RESULTS OF MONITORING:							
ROAD LOCATION							
CLOSED ROAD — OPEN ROAD							
OBJECTIVE / PRESCRIPTION:							
Closed to Public Vehicle Access							
FISHERIES / HYDROLOGY							
CLASS I CROSSING — CLASS II CROSSING — CLASS III CROSSING —							
FMU/AE TEMPERATURE SENSITIVITY: YES NO							
OBJECTIVE / PRESCRIPTION: No concerns identified.							
WILDLIFE							
IN HABITAT FOR OLD GROWTH SPECIES YES (see attached)							
OBJECTIVE / PRESCRIPTION: Best Unit size in deer winter range is 10 ac. or less. If less than unit is within Deer habitat							
69 concerns identified but unit is within Deer habitat (81-86 & 86-90). 69 ac. Deer & Old growth							
VISUAL RECREATION							
OBJECTIVE / PRESCRIPTION:							
Unit does not meet assigned VQO of Modification.							
SEE ATTACHED							
CULTURAL							
KNOWN SITE _____ PROBABILITY ZONE: HIGH — MEDIUM —							
OBJECTIVE / PRESCRIPTION:							
LOGGING SYSTEM							
OBJECTIVE / PRESCRIPTION: Hit lead yard							
REMARKS							
Elevation: See Attached							



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86-90 UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 86-90 FEIS)

UNIT #	EIS UNIT STATION	ACRES VOLUME FEES	ACRES 25 VOLUME CRUISE	SILVICULTURE OBJECTIVE / PRESCRIPTION: Clearcut followed by natural regeneration. Much evidence of wind throw in this area.
STATION				This is a medium to high productivity area (Ave site 90). PET at age 12-18 with a 20 year life cycle basis. Possible substitution on south boundary for timber deleted in unit 13. Refer to an attached memo for more info.
ROAD LINE AND NUMBER	41	176 "	255	
OBJECTIVES				
SOILS	HIGH HAZARD AREA	OBJECTIVE / PRESCRIPTION: No soil hazard concern identified.		
RESULTS OF MONITORING:				
ROAD LOCATION AND OBJECTIVE		CLOSED ROAD	OPEN ROAD	OBJECTIVE / PRESCRIPTION: Close to Public Vehicle Access
FISHERIES / HYDROLOGY CLASS I CROSSING — CLASS II CROSSING — CLASS III CROSSING — FHMU #2 TEMPERATURE SENSITIVITY: YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> OBJECTIVE / PRESCRIPTION: No concerns identified.				
WILDLIFE IN HABITAT FOR OLD GROWTH SPECIES GLS (see attached) OBJECTIVE / PRESCRIPTION: Best unit size is 10 acres or less. Less. No concerns identified but in OVR habitat habitats.				
VISUAL RECREATION ATTACHED <del>Unit does not meet assigned VQO if harvested with adjoining unit nr. 54.</del> ASSIGNED VQO of Modification				
CULTURAL KNOWN SITE PROBABILITY ZONE : HIGH — MEDIUM — OBJECTIVE / PRESCRIPTION :				
LOGGING SYSTEM OBJECTIVE / PRESCRIPTION: Hill end yard				
REMARKS — REMARKS: See Attached				



S E 15 23

## 86-90 UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 86-90 FEIS)

VOL 212	EIS UNIT #	23	ACRES	69	ARC 33 LOGGING SYSTEM	X
STAND #	VOLUME FEIS	1754	" VOLUME CRUISE	—	SILVICULTURE	OBJECTIVE / PRESCRIPTION: Clearcut followed by natural regeneration. This is a highly productive site (Farr 100). Monitor regeneration and precommercial thin at ages 12-15 yrs with timber emphasis. Retain an average of 25% open area for diversity.
FILE NAME	ARC 86-90					
ROAD LINE AND NUMBER	41 176	254			SOILS	HIGH HAZARD AREA —

CONCERNES LOCATE IN OTHER STRIP ALONG CREEK

No soil hazard concern identified.

## PLANNED (AERIAL PHOTO)



SCALE 1:5840

RESULTS OF MONITORING:  
ROAD LOCATION: CLOSED ROAD — OPEN ROAD — OBJECTIVE / PRESCRIPTION:  
AND OBJECTIVE: Close to Public Wildlife Access

FISHERIES / HYDROLOGY	CLASS I CROSSING	CLASS II CROSSING	CLASS III CROSSING
FMNU A	TEMPERATURE SENSITIVITY: YES	NO	NO
OBJECTIVE / PRESCRIPTION: Stream along north boundary; implement Class A fisheries protection. High potential for unimpeded off-channel rearing streams or multiple rearing channels. Crossing from east side of Waukuk Creek to west side; Class A crossing. Fish/Hydro review. See D			
WILDLIFE	IN HABITAT FOR OLD GROWTH SPECIES (See attached)	69 ac.	
OBJECTIVE / PRESCRIPTION:	Best unit size is 10 acres or less in deer winter range to maintain habitat diversity.		
RECREATION	No Identified Concerns but within our rotation habitat of SEE ATTACHED		
VISUAL			

CULTURAL	KNOWN SITE	PROBABILITY ZONE : HIGH — MEDIUM —
LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION: Head yard. Fell and yard away from stream buffer.	

REMARKS: Prescription: See attached  
Potential recreation site at First Bridge site on Whetlock Creek. - Potential of plane ridge trail on Semahay Ridge - None

SE-15 Z-1

## 86-90 UNIT, LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 86-90 FEIS)

EIS UNIT NAME LINE AND NUMBER	24 : ACRES APC 4 LOGGING SYSTEM H	SILVICULTURE OBJECTIVE / PRESCRIPTION: Clear cut followed by natural regeneration. This is a medium to high probability area with site index ranging from 80-100. Ave age s.t. under 90 (Farr). Monitor regeneration and at 12-15 yrs of age regenerate thin wood timber along the ridge. Retain an average of 2 stands per acre for diversity. See photo 41-254 for subsite information.
	VOLUME FEIS APC 86-90	HIGH HAZARD AREA — SOILS Soil hazard concern identified in top $\frac{1}{2}$ of unit and access road.
OBJECTIVES	Split into 2 unit housing trailer along stream moved bridge uphill $\approx$ 20' to bluffs	RESULTS OF MONITORING: ROAD LOCATION AND OBJECTIVE CLOSED ROAD — OPEN ROAD — CLOSED TO PUBLIC VEHICLE ACCESS
	Just 1/4 mile moved bridge.	FISHERIES / HYDROLOGY FMNU A CLASS I CROSSING — CLASS II CROSSING — CLASS III CROSSING — TEMPERATURE SENSITIVITY: YES — NO OBJECTIVE / PRESCRIPTION: Stream along south boundary implement class A preservation. Fish review off channel rearing streams.
PLANNED (AERIAL PHOTO) SCALE: 1:846	WILDLIFE INHABITAT FOR OLD GROWTH SPECIES OBJECTIVE / PRESCRIPTION: NO (see attached)	WILDLIFE INHABITAT FOR OLD GROWTH SPECIES OBJECTIVE / PRESCRIPTION: NO (see attached)
	Unit is just above riparian habitat.	VISUAL RECREATION OBJECTIVE / PRESCRIPTION: Unit meets assigned VQO of Maximum Modification SEE ATTACHED
CULTURAL	KNOWN SITE — PROBABILITY ZONE : HIGH — MEDIUM —	CULTURAL KNOWN SITE — PROBABILITY ZONE : HIGH — MEDIUM —
	LOGGING SYSTEM OBJECTIVE / PRESCRIPTION: H/lead yard. Fell and load away from stream bank.	LOGGING SYSTEM OBJECTIVE / PRESCRIPTION: H/lead yard. Fell and load away from stream bank.
		REMARKS: Reservation: See attached & Potential alpine ridge trail on Sonyahak Ridge. — Twp

SEIIS 25

## **86 - 90 UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 86-90 FEIS)**

VOL UNIT STAND SALE NAME PHOTO LINE AND NUMBER	EIS UNIT # 355 : ACRES 115 / 170 APP LOGGING SYSTEM IT	
	VOLUME FEIS APC 86.90	VOLUME CRUISE — APC 40.8 - 4.3
OBJECTIVES	<p><b>SOILS</b> HIGH HAZARD AREA — OBJECTIVE / PRESCRIPTION: Soil hazard concerns identified in NE 1/4 of unit.</p> <p><b>RESULTS OF MONITORING:</b></p> <p><b>ROAD LOCATION AND OBJECTIVE</b> CLOSED ROAD — OPEN ROAD — Close to Public Vehicle Access</p>	
FISHERIES / HYDROLOGY	<p><b>CLASS I CROSSING</b> — <b>CLASS II CROSSING</b> — <b>CLASS III CROSSING</b> <u>2</u></p> <p><b>TEMPERATURE SENSITIVITY:</b> YES — NO ✓</p> <p><b>OBJECTIVE / PRESCRIPTION:</b> High potential for small, unimpeded off-channel rearing or multiple channels near south boundary. Fish review Two Class C crossings within unit.</p>	
WILDLIFE	<p><b>IN HABITAT FOR OLD GROWTH SPECIES</b> NO (see attached)</p> <p><b>OBJECTIVE / PRESCRIPTION:</b> Large unit size restricts future options to maintain habitat diversity through the rotation period.</p> <p>No concerns identified</p>	
RECREATION	<p><b>VISUAL</b> OBJECTIVE / PRESCRIPTION:</p> <p><b>Unit meets Assured YQO of Maximum Modification</b></p> <p><b>SEE ATTACHMENT</b></p>	
CULTURAL	<p><b>KNOWN SITE</b> — PROBABILITY ZONE: HIGH — MEDIUM —</p> <p><b>OBJECTIVE / PRESCRIPTION:</b></p>	
LOGGING SYSTEM	<p><b>OBJECTIVE / PRESCRIPTION:</b> Head yard, yard away from unit lines.</p>	
REMARKS	<p>Recreation: See Attached &amp; Potential access trail - Sonya may be large - TRMP -</p>	

S-15 26

## 86-90 UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 86-90 FEIS)

Area		EIS UNIT #	26	ACRES	<u>150</u>	LOGGING SYSTEM	Road work	SILVICULTURE	OBJECTIVE / PRESCRIPTION: Clear cut harvested 1/2 to 1/3 of area. Artificial regeneration on slopes > 20% in S61 map units 5239B Selection System in corner in C692 area as shown on photo. Second year to winter kill hill along eastern boundary as shown on photo. Substitution from timber on western boundary as per photo. The productivity of this area is angled from 100% Forest Dependent species on slopes 12-18% and 100% Forest Dependent species on slopes 22-26% per acre for diversity.
		VOLUME FEIS	384822	VOLUME CRUISE	—				
		NAME	APC	86-90					
		TOPO LINE AND NUMBER	40B	1876	43				
OBJECTIVES		Leave road along creek. No trail within unit split.							
								No soil hazard concern identified	
								RESULTS OF MONITORING:	
		ROAD LOCATION AND OBJECTIVE		CLOSED ROAD	OPEN ROAD	CLOSED TO PUBLIC	VEHICLE ACCESS	OBJECTIVE / PRESCRIPTION:	
				<u>CLOSED TO PUBLIC</u>					
		FISHERIES / HYDROLOGY		CLASS I CROSSING	CLASS II CROSSING	CLASS III CROSSING	CLASS IV CROSSING		
		FHNU		TEMPERATURE SENSITIVITY: YES	NO				
		OBJECTIVE / PRESCRIPTION:		Several class C streams dissect unit. Southern boundary borders class A fish stream. Fish / Hydro review					
WILDLIFE		IN HABITAT FOR OLD GROWTH SPECIES VQO (See attached)						OBJECTIVE / PRESCRIPTION: Large unit size will restrict options in the future to maintain habitat diversity.	
								No identified concerns.	
		VISUAL RECREATION		Unit meets Assigned VQO of Maximum Modification SEE ATTACHED				OBJECTIVE / PRESCRIPTION:	
CULTURAL		KNOWN SITE PROBABILITY ZONE: HIGH — MEDIUM —						OBJECTIVE / PRESCRIPTION:	
								LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION: Head cut and Stream buffer
								REMARKS	Location: See attached Radar alarm trail on Sonoyah Ridge



S E 15 27

## 86 - 90 UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 86-90 FEIS)

CD 212	EIS UNIT # <u>31</u>	ACRES <u>34</u>	LOGGING SYSTEM <u>H</u>	SILVICULTURE OBJECTIVE / PRESCRIPTION: Clearcut harvest with natural regeneration. This is a medium to high site productivity from 80-95 Fann Ave. site under is 87 (Fair). Retain an acre .08 acres per acre for diversity. This unit/layered out 5/89.
UNIT NAME	VOLUME FEIS	<u>9D4</u>	VOLUME CRUISE	
PROJECT LINE AND NUMBER	APC	<u>80-90</u>		
OBJECTIVES	Dropped east Vetus unit and moved baseline west portion.			
SCALE:	<u>15840</u>			
FISHERIES / HYDROLOGY	CLASS I CROSSING <input checked="" type="checkbox"/>	CLASS II CROSSING <input type="checkbox"/>	CLASS III CROSSING <input type="checkbox"/>	
ROAD LOCATION AND OBJECTIVE	CLOSED ROAD	OPEN ROAD	OPEN ROAD	OBJECTIVE / PRESCRIPTION: <u>Closed to Public Vehicle Access</u>
RESULTS OF MONITORING:				
WILDLIFE	IN HABITAT FOR OLD GROWTH SPECIES <u>D0</u> (see attached) OBJECTIVE / PRESCRIPTION:			
<p style="text-align: center;"><u>NO Concern</u></p> <p>VISUAL RECREATION OBJECTIVE / PRESCRIPTION:</p> <p>Unit meets Assured VQO of Maximum Modification <u>SEE ATTACHED</u></p> <p>CULTURAL KNOWN SITE OBJECTIVE / PRESCRIPTION:</p> <p>PROBABILITY ZONE : HIGH — MEDIUM —</p> <p>LOGGING SYSTEM OBJECTIVE / PRESCRIPTION: <u>Head yard. Follow yard away from waterholes + stream bed.</u></p> <p>REMARKS <u>Recreation; See attached Potential alpine trail on long slope</u></p> <p style="text-align: right;"><u>OJW</u></p>				

Set 15 28

86 - 90 UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 86-90 FEIS)

EIS UNIT #	28	ACRES	157	LOGGING SYSTEM	1+	SILVICULTURE OBJECTIVE / PRESCRIPTION: Clear cut to 16' x 16' residual regrowth, and artificial regeneration. Plant species 60% as in Soil unit 5234B (there are also a few areas at 12-18 yrs in unit natural regeneration). No major regeneration and 10% of open diversity. High site productivity area. ST 95 (Farr).
VOLUME FEIS	4176	VOLUME CRUISE	—	SOILS OBJECTIVE / PRESCRIPTION: Soil hazard may touch unit boundary at NE corner.	—	SOILS OBJECTIVE / PRESCRIPTION: Soil hazard may touch unit boundary at NE corner.
APC	86-90	LINE AND NUMBER	29B	RESULTS OF MONITORING: Closed road — Open road — Objective / Prescription: Close to Public Vehicle Access	RESULTS OF MONITORING: Closed road — Open road — Objective / Prescription: Close to Public Vehicle Access	RESULTS OF MONITORING: Closed road — Open road — Objective / Prescription: Close to Public Vehicle Access
Agreed to unit . Phase II 9/26						FISHERIES / HYDROLOGY FHNU A OBJECTIVE / PRESCRIPTION: Stream along south boundary listed as Class A stream.
PLANNED (AERIAL PHOTO) SCALE: 15840						WILDLIFE IN HABITAT FOR OLD GROWTH SPECIES OBJECTIVE / PRESCRIPTION: The lower 1/2 of this unit is in riparian habitat. Large units restrict future options to maintain habitat diversity throughout
						VISUAL RECREATION OBJECTIVE / PRESCRIPTION: The rotation period. Unit meets Assigned VQO of Maximum Modification See Attached
						CULTURAL KNOWN SITE OBJECTIVE / PRESCRIPTION : HIGH — MEDIUM —
						LOGGING SYSTEM OBJECTIVE / PRESCRIPTION: Hillside 10' & fell and yard away from Stream bank
						REMARKS Preparation: See Attached Potential disturbance on Sonychay Ridge TRMP



S E I S 33

## 86 - 90 UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 86-90 FEIS)

YR: 2013	EIS UNIT # <u>33</u>	ACRES <u>40.37</u>	ARC 3 ANNEX LOGGING SYSTEM H	SILVICULTURE OBJECTIVE / PRESCRIPTION: Clearcut harvest followed by natural regeneration. This is a highly productive area (Finn Sike Valley). Monitor regen. Age cap 12-18 yrs precommercial thin with wildlife emphasis. Repair an ave. of 2 snap per acre for diversity. Unit layout 4/89.
YR:	VOLUME FEIS	<u>944.670</u>	VOLUME CRUISE	area
SALVAGE	ADS	<u>86-90</u>		(Finn Sike Valley '00). Monitor regen. Age cap 12-18 yrs
PHOTO LINE AND NUMBER	PHOTO LINE	UNIT # <u>41</u>	—	precommercial thin with wildlife emphasis. Repair an ave. of 2 snap per acre for diversity. Unit layout 4/89.
OBJECTIVES				Move Unit farther upstream to leave transient estuary area. Create buffer along the paleoind area below road.
				SOILS HIGH HAZARD AREA — No soil hazard concern identified.
				OBJECTIVE / PRESCRIPTION:
				RESULTS OF MONITORING: ND OBJECTIVE
				CLOSED ROAD — OPEN ROAD — Close to Public Vehicle Access OBJECTIVE / PRESCRIPTION:
				FISHERIES / HYDROLOGY CLASS I CROSSING — CLASS II CROSSING — CLASS III CROSSING — FHMU A TEMPERATURE SENSITIVITY: YES NO OBJECTIVE / PRESCRIPTION: stream along southern boundary: implement class A prescriptions. Fish input needed.
				WILDLIFE IN HABITAT FOR OLD GROWTH SPECIES OBJECTIVE / PRESCRIPTION: 37ac. DWR & old growth unit is in DWR Robert habitat. Best unit size in deer winter range is 10 acres or less.
				VISUAL RECREATION OBJECTIVE / PRESCRIPTION: Unit meets VQO of Maximum Modification SEE ATTACHED
				CULTURAL KNOWN SITE — PROBABILITY ZONE: HIGH — MEDIUM — OBJECTIVE / PRESCRIPTION:
				LOGGING SYSTEM OBJECTIVE / PRESCRIPTION: Hillhead Yards. Fall and yard away from Stream Buffer
				REMARKS Recreation: See Attached Potential recreation site at First Bridge Site of Whetlock Creek — Potential access trail on Songahay Ridge.



PURPOSE (AERIAL PHOTO) SCALE: 15B40

S E C S 3 C 1

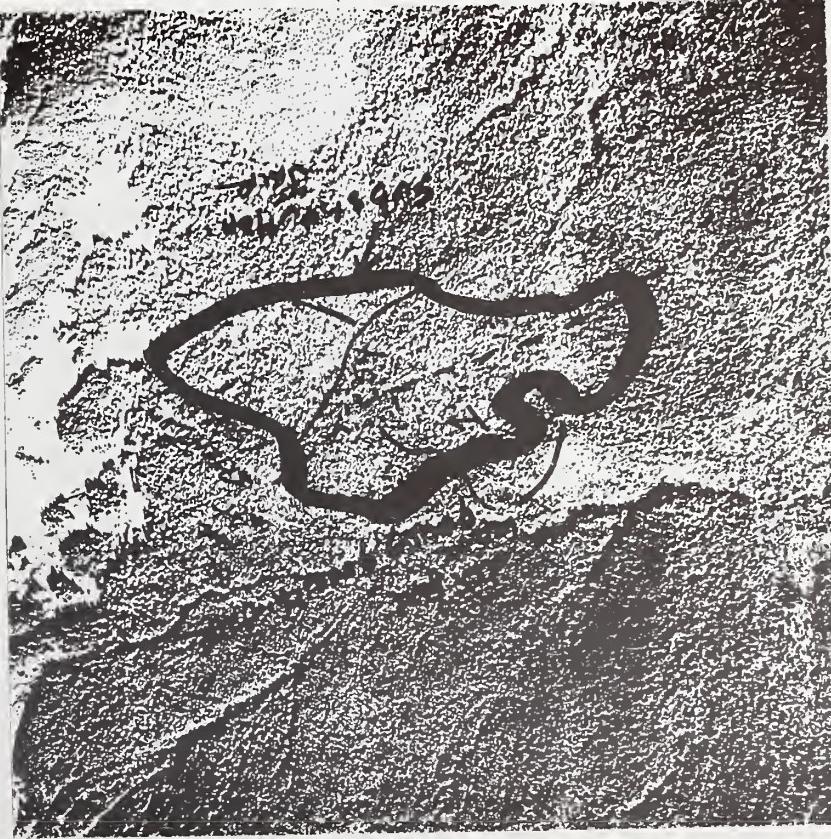
## 86 - 90" UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 86-90 FEIS)

EIS. UNIT # <u>31</u>	ACRES <u>24</u>	LOGGING SYSTEM <u>I-II</u>	SILVICULTURE OBJECTIVE / PRESCRIPTION: Clearcut harvest followed by natural regeneration. This is a big log production area (Airsite under 97). Monitor regen. and protect ages 12 - 18 yrs with timber emphasis. Retain 2 sugar pine and 2 white firs for diversity. Possible addition at west side of unit to site for soil deletion in U.M.U. 23.
VOLUME FEIS <u>1989 1992 VOLUME CRUISE</u>	VOLUME FEIS <u>APC 2000</u>	LINE AND NUMBER <u>41 254</u>	SOILS HIGH HAZARD AREA — OBJECTIVE / PRESCRIPTION: No soil hazard concern identified.
OBJECTIVES: Split into 2 units following timber along 100' + 40' wide backline uphill to 200' to 210' to 220'		RESULTS OF MONITORING: Open cut areas for 200' to 210' to 220'	CLOSED ROAD — OPEN ROAD — OBJECTIVE / PRESCRIPTION: Close to Public vehicle access
PLANNED (AERIAL PHOTO)		SCALE: <u>1:5840</u>	FISHERIES / HYDROLOGY CLASS I CROSSING — CLASS II CROSSING — CLASS III CROSSING — FHNU <u>A</u> TEMPERATURE SENSITIVITY: YES — NO <u>—</u> OBJECTIVE / PRESCRIPTION: Fish stream along northern boundary implement class A prescriptions. Fish/Hydro review needed.
		ROAD LOCATION AND OBJECTIVE	WILDLIFE IN HABITAT FOR OLD GROWTH SPECIES <u>YES</u> (see attached) 40ac. OBJECTIVE / PRESCRIPTION: The lower 1/2 of this unit is located in riparian habitat. A 100' buffer at least on each side of the stream should protect <u>existing</u> riparian habitat values.
		RECREATION VISUAL CULTURAL	OBJECTIVE / PRESCRIPTION: Unit meets assigned VQD of Maximum Modification SEE ATTACHED KNOWN SITE — PROBABILITY ZONE: HIGH — MEDIUM — OBJECTIVE / PRESCRIPTION:
		LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION: Hit end yard. Fell around corner from Stream Buffer.
		REMARKS	Potential alien trail - Sonyahay Ridge.



## 81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)

VCU 212	EIS UNIT # <u>54</u>	ACRES <u>.00</u>	LOGGING SYSTEM <u>H/L</u>	SILVICULTURE OBJECTIVE / PRESCRIPTION: Clean cut harvest followed by natural regeneration. This is a medium to high productivity area with SI ranging from 80-100 (average is 85). Define two small patches of young growth (blown down origin) of windfall for diversity. Substitute timber on east boundary. Retain ave. of 2 snags per acre for diversity.
STAND #	VOLUME FEIS <u>160.0</u>	VOLUME CRUISE <u>—</u>		
SALE NAME <u>A7A-3</u>	PHOTO LINE AND NUMBER <u>4DB-41</u>			
<b>OBJECTIVES</b>				<b>SOILS</b> <u>High hazard area</u> <b>OBJECTIVE / PRESCRIPTION:</b> Lack of soil cohesion will result in severe soil erosion. <b>PLN</b> <u>9/89</u>
<b>RESULTS OF MONITORING:</b>				<b>ROAD LOCATION</b> <u>CLOSED ROAD — OPEN ROAD —</u> <b>OBJECTIVE / PRESCRIPTION:</b> Block <u>K</u> allows to grow <u>class 3</u> seed
<b>PLANNED (ORTHO PHOTO)</b>				<b>WILDLIFE</b> <u>IN HABITAT FOR OLD GROWTH SPECIES</u> <u>No.</u> <u>(see attached)</u> <b>OBJECTIVE / PRESCRIPTION:</b>
				<b>FISHERIES / HYDROLOGY</b> <u>CLASS I CROSSING</u> <u>CLASS II CROSSING</u> <u>CLASS III CROSSING</u> <u>FWIW</u> <u>TEMPERATURE SENSITIVITY: YES</u> <u>NO</u> <u>—</u> <b>OBJECTIVE / PRESCRIPTION:</b>
				<b>NO CONCESSION IDENTIFIED</b> <u>5/14 9/89</u>
				<b>VISUAL RECREATION</b> <u>OBJECTIVE / PRESCRIPTION:</u> <u>SEE ATTACHED</u>
				<b>ASSUMPTIONS</b> <u>UGD — MODIFICATION</u> <u>Unit does not meet assigned VGD</u>
				<b>CULTURAL</b> <u>KNOWN SITE</u> <u>PROBABILITY ZONE: HIGH — MEDIUM</u> <u>—</u> <b>OBJECTIVE / PRESCRIPTION:</b>
				<b>LOGGING SYSTEM</b> <u>OBJECTIVE / PRESCRIPTION:</u> <u>Hi lead yard, low late top;</u> <u>spur to action point in triple small settings</u> <u>to reduce slope tension concerns.</u>
				<b>REMARKS</b> <u>Recreation: See Attached</u>



14 ac.

## 96 - 90 UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 86-90 FEIS)

VCU 313	EIS UNIT	LOGGING SYSTEM H	SILVICULTURE	OBJECTIVE / PRESCRIPTION: Plant approximately 15 ac. adjacent to brush field following naturally occurring regeneration during timber harvest leave at least 2 snags/acre & square of 50' x 50' for snags & old growth objectives. A PCT @ 12-18% w/ both wildlife & timber objectives. 1/2-3/4 acre objective.
STAND *	VOLUME FEES	363	VOLUME CRUISE	
SALE NAME	AC-	86-90		
PHOTO LINE AND NUMBER	37	276 - 339		
OBJECTIVES				
RESULTS OF MONITORING:				
PLANNED (AERIAL PHOTO)	scale: 15840	ROAD LOCATION AND OBJECTIVE	CLOSED ROAD — OPEN ROAD —	OBJECTIVE / PRESCRIPTION: Block All access to grass closed
				
FISHERIES / HYDROLOGY	CLASS I CROSSING —	CLASS II CROSSING —	CLASS III CROSSING —	
FINM / NO TEMPERATURE SENSITIVITY: YES — NO —				
OBJECTIVE / PRESCRIPTION:	No fish species concerns. Hydro review needed. Prevent V-North Landslide cutbank for water quality/direction. Falling away from cutbank. DK 9/12/89			
WILDLIFE	IN HABITAT FOR OLD GROWTH SPECIES YES (see attached)			
Road unit entirely within old growth retention 14 ac ea habitat. Move road back from beach & maintain ungrazed beach ridge below road				
VISUAL RECREATION	OBJECTIVE / PRESCRIPTION: Unit meets assigned VCO of Modification SEE ATTACHED			
CULTURAL	KNOWN SITE	PROBABILITY ZONE	HIGH — MEDIUM —	
		OBJECTIVE / PRESCRIPTION:		
LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION: Fall lead yard. Fall and yard away from channel on east side of unit			
REMARKS	Recreation: See attached			

3

**25 ac  
86 - 90 UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 86-90 FEIS)**

VCU	213	EIS UNIT	LOGGING SYSTEM H	SILVICULTURE	OBJECTIVE / PRESCRIPTION: ALLOW TO REGENERATE NATURALLY. DURDLE TIN & HER HARVEST AT LEAST TWO SNAGS / ACRE AND CLUMPS OF STANDING TREES FOR STAND DIVERSITY. THIS UNIT IS IN A HIGHLY PRODUCTIVE SITE (SI ~97% FULL GROWTH) IN OPTIMUM CRITICAL DEER WINTER RANGE. SCHEDULE A RET @ 12-18 YEARS UP. BOTH WILDLIFE & TIMBER OBJECTIVES.
STAND #	-	VOLUME FEIS	478		
SALE NAME	APC	VOLUME FEIS	86 - 90		
PHOTO LINE AND NUMBER	3833	476 - 105			
OBJECTIVES	UNIT SHOULD STAY AS LAYED OUT. JFT 9-9-89 3625-0173 (77) 5/33 8/85 (77)				

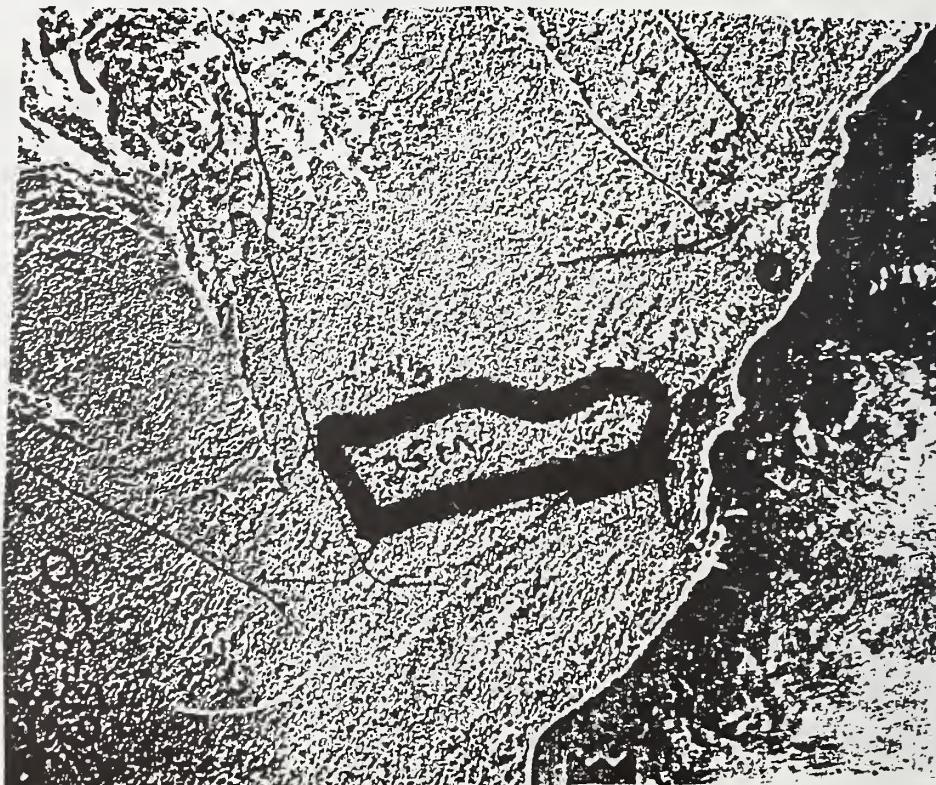


RESULTS OF MONITORING:		ROAD LOCATION AND OBJECTIVE	CLOSED ROAD	OPEN ROAD	OBJECTIVE / PRESCRIPTION:
		BLOC (C) 11 lines to ground Closed			
FISHERIES / HYDROLOGY	CLASS I CROSSING	CLASS II CROSSING	CLASS III CROSSING		
FMNU NO TEMPERATURE SENSITIVITY: YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>					
OBJECTIVE / PRESCRIPTION: No Concerns identified					
No concensus					
WILDLIFE	IN HABITAT FOR OLD GROWTH SPECIES YES (see attached) engle nest trees which will be retained until the road is moved 330' up hill from the end of the remaining beach former. The road & beach will be restored.				
RECREATION	DK <input type="checkbox"/> Unit meets assigned VGO of Modification. Recommend retaining beach fence to help increase unit. SEE ATTACH				
CULTURAL	KNOWN SITE	PROBABILITY ZONE : HIGH — MEDIUM — OBJECTIVE / PRESCRIPTION :			
LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION: Hill end yard. No concerns Jenki				
REMARKS	Recreation: See attached				

4

53 ac

## 86 - 90 UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 86-90 FEIS)

VCU 213	EIS UNIT # 6	ACRES 1283	LOGGING SYSTEM #1	SILVICULTURE ALLOW TO REGENERATE NATURALLY FOLLOWING CLEAR CUTTINGS DURING HARVEST, LEAVE AT LEAST 2 SNAGS/ACRE & CLEUPS OF SAPLINGS FOR STAND DIVERSITY. STAND DIVERSITY OF THE 4 ACR. SITE INDEX FOR THIS UNIT IS ~90. SCHEDULE A FCT @ 12-18 YR. WITH BOTH TIMBER & WILDLIFE OBJECTIVES AS THIS UNIT LIES IN THE OLD GROWTH SPECIES REFERENCE AREA. JPT 29-87 SOILS 90 HIGH HAZARD AREA	OBJECTIVE / PRESCRIPTION: <i>The stream can planted</i>
STAND #	VOLUME FEIS	VOLUME CRUISE			
SALE NAME	APC	86-90			
PHOTO LINE AND NUMBER	37	276-339			
OBJECTIVES	Strengthen leave strip at S end of unit depending on location of rest tree maintain buffer on stream.				
PLANNED (AERIAL PHOTO)					
ROAD LOCATION AND OBJECTIVE	CLOSED ROAD	OPEN ROAD	OBJECTIVE / PRESCRIPTION:	<p><i>Block all roads to your closed</i></p>	
FISHERIES / HYDROLOGY	CLASS I CROSSING	CLASS II CROSSING	CLASS III CROSSING		
FRNU	<del>NO</del>	TEMPERATURE SENSITIVITY: YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>			
OBJECTIVE / PRESCRIPTION:	No concerns identified, other than class III water quality concern, natural SO buffer with Fairview Channel to south west corner of unit.				
WILDLIFE	IN HABITAT FOR OLD GROWTH SPECIES YES (see attached)				DUR 20 old growth 53 ac. ea.
ROAD LOCATION AND OBJECTIVE	avoid the Eagle nest tree by 330'. By highway in reference area				
VISUAL RECREATION	KNOWN SITE	PROBABILITY ZONE:	HIGH — MEDIUM	OBJECTIVE / PRESCRIPTION:	
Unit meets VQO of Modification					
LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION:	H/1 End Yard. Fall and yard away from buffer & no log.			
REMARKS	Recreation; see attached				

## 86 - 90 UNIT, LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 86-90 FEIS)

<p><b>EIS UNIT #</b> <u>213</u>    <b>ACRES</b> <u>7</u>    <b>LOGGING SYSTEM #</b> <u>1</u></p> <p><b>STAND #</b> <u>     </u>    <b>VOLUME FEIS</b> <u>220</u>    <b>VOLUME CRUISE</b> <u>     </u></p> <p><b>SALE NAME</b> <u>APC</u>    <b>86 - 90</b>    <b>PHOTO LINE AND NUMBER</b> <u>3 - 7</u>    <u>276 - 339</u></p> <p><b>OBJECTIVES</b></p>	<p><b>SILVICULTURE</b>    <b>OBJECTIVE / PRESCRIPTION:</b> ALLOW TO REGENERATE NATURALLY, HARVEST, LEAVES CLUMPS OF SPROUTS &amp; AT LEAST TWO STAGS/ACRE. FOR STAND DIVERSITY. THIS UNIT LIES IN THE OLD GROWTH RETENTION AREA. ROAD HAS A SITE INDEX ~ 90. SCHROEDER, A PCT @ 12-18 yrs. SF ~ 10. WITH WILDLIFE &amp; TIMBER OBJECTIVES. JPT 9-9-89 <i>[Signature]</i></p>	<p><b>HYDROLOGY</b>    <b>OBJECTIVE / PRESCRIPTION:</b> DURING HARVEST, LEAVES CLUMPS OF SPROUTS &amp; AT LEAST TWO STAGS/ACRE. FOR STAND DIVERSITY. THIS UNIT LIES IN THE OLD GROWTH RETENTION AREA. ROAD HAS A SITE INDEX ~ 90. SCHROEDER, A PCT @ 12-18 yrs. SF ~ 10. WITH WILDLIFE &amp; TIMBER OBJECTIVES. JPT 9-9-89 <i>[Signature]</i></p>	<p><b>WILDLIFE</b>    <b>OBJECTIVE / PRESCRIPTION:</b> IN HABITAT FOR OLD GROWTH SPECIES YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> FISH + WILDLIFE UNITS OR RETENTION AREA. ROAD NEEDS TO BE MOVED MORE THAN 330' FROM EAGLE NEST TREES. WIDEN ROAD &amp; MAINTAIN ONE BORDERED BEACH FRINGE BETWEEN ROAD &amp; BEACH.</p>	<p><b>RECREATION</b>    <b>OBJECTIVE / PRESCRIPTION:</b> VISUAL</p>	<p><b>CULTURAL</b>    <b>KNOWN SITE</b> <input type="checkbox"/> <b>PROBABILITY ZONE :</b> HIGH — MEDIUM —</p>	<p><b>LOGGING SYSTEM</b>    <b>OBJECTIVE / PRESCRIPTION:</b> 1/1600 YARD FIELD FELL AND YARD AWAY FROM STREAM CHANNELS.</p>	
<p><b>RESULTS OF MONITORING:</b></p> <p><b>ROAD LOCATION</b> <input type="checkbox"/> <b>CLOSED ROAD</b> <input checked="" type="checkbox"/> <b>OPEN ROAD</b> <input type="checkbox"/> <b>OBJECTIVE / PRESCRIPTION:</b> <u>13 (see) Allowable Growth Closed</u></p>		<p><b>FISHERIES / HYDROLOGY</b>    <b>CLASS I CROSSING</b> <input type="checkbox"/> <b>CLASS II CROSSING</b> <input type="checkbox"/> <b>CLASS III CROSSING</b> <input type="checkbox"/></p> <p><b>FMNU</b> <input checked="" type="checkbox"/> <b>TEMPERATURE SENSITIVITY:</b> YES <input type="checkbox"/> NO <input checked="" type="checkbox"/></p> <p><b>OBJECTIVE / PRESCRIPTION:</b> CLASS C STREAMS DIRECTLY W/ FISH + WATER QUALITY/DIVERSITY. DUR &amp; OLD GROWTH 45ac. Beach firing was widen to above road 345' to</p> <p><b>My draw review needed</b> Fall line from V-North channel on north slope, Due 2/3/89</p>		<p><b>RECREATION</b>    <b>OBJECTIVE / PRESCRIPTION:</b> SEE ATTACHED</p>		<p><b>REMARKS</b> <b>Prescription:</b> See Attached</p>	
<p><b>PLANNED (AERIAL PHOTO)</b>    <b>SCALE:</b> <input type="checkbox"/></p> 							

# 81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)

VAC 2/3	EIS UNIT # <u>44</u>	ACRES <u>105</u>	LOGGING SYSTEM <u>1/1</u>	SILVICULTURE	OBJECTIVE / PRESCRIPTION: WHEN X-CUTTING THIS UNIT, LEAVE AT LEAST 2 SNAGS/ACRE FOR STAND DIVERSITY. THERE APPEARS TO BE NUMEROUS CLUMPS OF SAPLINGS/ACRE FROM LAST LULLAR THROU. IF IT IS PRACTICAL, TRY TO LEAVE THESE CLUMPS DURING HARVEST ACTIVITIES. ALLOW THIS UNIT TO REGENERATE NATURALLY BUT CLOSELY MONITOR THE SOUTH & SOUTHEAST BACKLINE FOR A POTENTIAL REGROWTH TALL TREES. MOST OF THESE WOULD BE PRODUCTIVE SITE (S-I=100) & IS ADJACENT TO THE AD & SOUTHWESTERN PART OF THE 81-90 SEIS. CONSULT WILDLIFE BIOGISTS TO SEE IF WILDLIFE PROBLEMS EXIST.
STAND #	VOLUME FEIS	<u>3402</u>	VOLUME CRUISE		
SALE NAME	<u>AH 03</u>				
PHOTO LINE AND NUMBER	<u>39B - 476 # 80</u>				
OBJECTIVES	Provide volume for the 86-90 operating period.				
					HIGH HAZARD AREA — OBJECTIVE / PRESCRIPTION:

RESULTS OF MONITORING:		
ROAD LOCATION AND OBJECTIVE	CLOSED ROAD — Closed to Public & vehicle Access	OPEN ROAD — OBJECTIVE / PRESCRIPTION:
PLANNED (ORTHO PHOTO)	SCALE: .	



FISHERIES / HYDROLOGY	CLASS I CROSSING <input checked="" type="checkbox"/>	CLASS II CROSSING <input type="checkbox"/>	CLASS III CROSSING <input type="checkbox"/>
WILDLIFE	FMHU <input type="checkbox"/>	TEMPERATURE SENSITIVITY: YES <input type="checkbox"/>	NO <input type="checkbox"/>
OBJECTIVE / PRESCRIPTION: NO CONCERN IDENTIFIED.			
	DK 9/12/89.		
WILDLIFE	IN HABITAT FOR OLD GROWTH SPECIES <input checked="" type="checkbox"/> Yes (see attached)		
OBJECTIVE / PRESCRIPTION: Good Silvicultural Rx.			
Unit is located just above deer winter range. Old growth 20ac			
VISUAL RECREATION	OBJECTIVE / PRESCRIPTION: <u>SEE ATTACHED</u>		
Assisted VPD = Modification and does not meet assigned VPD			
CULTURAL	KNOWN SITE <input type="checkbox"/>	PROBABILITY ZONE : HIGH <input type="checkbox"/>	— MEDIUM <input type="checkbox"/>
OBJECTIVE / PRESCRIPTION:			

LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION: <u>Hi/lo end of yard, no specific contours identified.</u>
REMARKS	Recreation: See attached

6

## 81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS.)

1) VCU <u>2/3</u>	EIS UNIT # <u>55</u>	ACRES <u>4/8</u>	LOGGING SYSTEM <u>RL</u>	SILVICULTURE OBJECTIVE / PRESCRIPTION: Clear cut harvest followed by natural regeneration. Site productivity ranges from low to high (55 to 1005.7 Board. Ave. SI is 80. Precom. thin at age 12-18 yrs with a wildlife camp basis. Retain an ave. of 25% per ac. for diversity.
STAND # <u>AA 03</u>	VOLUME FEIS <u>1/62</u>	VOLUME CRUISE <u>—</u>		
SALE NAME <u>—</u>				
PHOTO LINE AND NUMBER <u>403 - 40</u>				
<u>OBJECTIVES</u> Provide Volume for the 86-90 operating period				<u>RESULTS OF MONITORING:</u> ROAD LOCATION <u>CLOSED ROAD</u> — OBJECTIVE / PRESCRIPTION: <u>Closed to Public Vehicle Traffic</u>
<u>PLANNED (ORTHO PHOTO)</u>				<u>RESULTS OF MONITORING:</u> ROAD LOCATION <u>CLOSED ROAD</u> — OBJECTIVE / PRESCRIPTION: <u>Closed to Public Vehicle Traffic</u>
FISHERIES / HYDROLOGY	CLASS I CROSSING <u>—</u>	CLASS II CROSSING <u>—</u>	CLASS III CROSSING <u>—</u>	
WILDLIFE	FMHU <u>NO</u>	TEMPERATURE SENSITIVITY: <u>YES</u> <u>NO</u>		
OBJECTIVE / PRESCRIPTION: <u>No concerns identified.</u> DK <u>9/12/89.</u>				
VISUAL RECREATION	OBJECTIVE / PRESCRIPTION: <u>SEE ATTACHED</u>			
CULTURAL	KNOWN SITE <u>—</u>	PROBABILITY ZONE: <u>HIGH</u> <u>MEDIUM</u> <u>—</u>		
LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION: <u>High lead yard. No concerns</u>			
REMARKS <u>Permutation see attached</u>				



**81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS.)**

VCU 2/3	EIS UNIT # <u>152</u>	ACRES <u>100</u>	LOGGING SYSTEM <u>H/C</u>	SILVICULTURE Balancing favoring old growth conifers over east 1/2 of unit on mixed Conifer/Planl associations. Plant species in west 1/2 of unit often same. This area ranges from low to high productivity.	OBJECTIVE / PRESCRIPTION: Clear cut harvest followed by sub-stripe oldgrowth in Eastern boundary of unit.
STAND #	VOLUME FEIS <u>2034</u>	VOLUME CRUISE <u>—</u>	SALE NAME <u>AIA 03</u>	PHOTO LINE AND NUMBER <u>—</u>	OBJEVTIVE / PRESCRIPTION: <u>SOILS</u> HIGH HAZARD AREA —
<b>OBJECTIVES</b> Provide volume for Yhe 86-90 operating period.				10 Soils concerns 124 9/24	
RESULTS OF MONITORING:					
ROAD LOCATION AND OBJECTIVE		CLOSED ROAD	OPEN ROAD	OBJECTIVE / PRESCRIPTION: <u>Closed to Public vehicle access</u>	
FISHERIES / HYDROLOGY					
CLASS I CROSSING FISH & TEMPERATURE		CLASS II CROSSING NO	CLASS III CROSSING NO	OBJECTIVE / PRESCRIPTION: <u>No concerns identified.</u>	
WILDLIFE					
IN HABITAT FOR OLD GROWTH SPECIES		YES (See attached) old growth 200			
OBJECTIVE / PRESCRIPTION: The Southwest corner of the unit is located in old growth habitat. Large unit size such as this will restrict future options to manage for habitat diversity. Best unit size in emphasis species habitat is 10 acres or less.					
VISUAL RECREATION					
SEE ATTACHED					
<u>Assessments VPO = Monitoring</u> <u>Unit does not meet assigned VPO</u>					
CULTURAL KNOWN SITE		PROBABILITY ZONE: HIGH — MEDIUM — OBJECTIVE / PRESCRIPTION: <u>—</u>			
LOGGING SYSTEM <u>Sub</u>		OBJECTIVE / PRESCRIPTION: <u>Hiland yard, no jipers</u>			
REMARKS <u>Recreation; See attached</u>					



UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81 - 90 SEIS.)

VCU <u>2/3</u>	EIS UNIT # <u>1/53</u>	ACRES <u>88</u>	LOGGING SYSTEM _____	SILVICULTURE OBJECTIVE / PRESCRIPTION: Clearcut followed by natural regeneration. This is a highly productive site (Farr 100). At age 12-18 PCT with wildlife emphasis. Retain an acre of 2 snags per acre for diversity. Define growth front to the new boundary and substitute on North boundary.
STAND # —	VOLUME FEET <u>2341</u>	VOLUME CRUISE —	age 12-18 PCT with wildlife emphasis. Retain an acre of 2 snags per acre for diversity. Define growth front to the new boundary and substitute on North boundary.	
SALE NAME <u>AP 03</u>	PHOTO LINE AND NUMBER	OBJECTIVES Provide volume for the 86-90 operating period.	SOILS HIGH HAZARD AREA _____ OBJECTIVE / PRESCRIPTION :  No soils concern PW 9/59	
PLANNED (ORTHO PHOTO)		SCALE : _____	RESULTS OF MONITORING: ROAD LOCATION ROAD LOCATION CLOSED ROAD — OPEN ROAD — OBJECTIVE / PRESCRIPTION: CLOSED to Public vehicle access	
			FISHERIES / HYDROLOGY CLASS I CROSSING — FHMU — TEMPERATURE SENSITIVITY: YES — NO — OBJECTIVE / PRESCRIPTION:	
			WILDLIFE IN HABITAT FOR OLD GROWTH SPECIES OBJECTIVE / PRESCRIPTION: Yes 88 acres Old Growth range. Best unit size to maintain deer winter habitat values is 10 acres or less. Retain 2 down logs and 50% per acre. RECREATION VISUAL OBJECTIVE / PRESCRIPTION: SEE ATTACHED ASSISTED VPO = MODIFICATION	
			CULTURAL KNOWN SITE — PROBABILITY ZONE : HIGH — MEDIUM — OBJECTIVE / PRESCRIPTION :	
			LOGGING SYSTEM OBJECTIVE / PRESCRIPTION	
			REMARKS : See Attached d	



SEIS.1

## 86 - 90 UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 86-90 FEIS)

VCU 214	EIS UNIT *	LOGGING SYSTEM H	SILVICULTURE OBJECTIVE / PRESCRIPTION:  Clearcut followed by natural regeneration. It is a high gradient site (Fall 95). Pre-comm thin stage 12-18 with a timber harvest. Retain ave. 2 snags per acre for diversity. JMR 9/7/89
STAND *	VOLUME FEIS	1171	VOLUME CRUISE —
SALE NAME	APC	86-90	
PHOTO LINE AND NUMBER	36.B - 376	- 349	
OBJECTIVES	Loc to Stream bank.		
RESULTS OF MONITORING:			
ROAD LOCATION AND OBJECTIVE		CLOSED ROAD — DISCOURAGE TRAVEL	OPEN ROAD — ALL ACCESS TO STREAM
FISHERIES / HYDROLOGY		CLASS I CROSSING — FHNU A	CLASS II CROSSING — NO FISH STREAM ALONG WEST BOUNDARY
SENSITIVITY: YES → NO OBJECTIVE / PRESCRIPTION: FIRST STREAM along west boundary implement class A prescription. Fish/Hydro input needed.			
WILDLIFE OBJECTIVE / PRESCRIPTION: THE western boundary of this unit lies in Riparian habitat. 15m streambank — direction is to log to stream bank — however Hot grid for wildlife cover			
VISUAL RECREATION OBJECTIVE / PRESCRIPTION: Unit meets VQO of Modification see ATTACHMENT			
CULTURAL KNOWN SITE — PROBABILITY ZONE: HIGH, MEDIUM OBJECTIVE / PRESCRIPTION:			
LOGGING SYSTEM OBJECTIVE / PRESCRIPTION: 4/1/ each year. Fall and year away from streambank			
REMARKS: Recreation; see attached			



## SEIS 2

## 86-90 UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 86-90 FEIS)

VCU 214	EIS UNIT # <u>2</u>	LOGGING SYSTEM # <u>1</u>	SILVICULTURE	OBJECTIVE / PRESCRIPTION: <u>to reduce Regeneration following logging</u>
STAND #	VOLUME FEIS <u>857</u>	VOLUME CRUISE —	CLEARCUT FOLLOWED BY NATURAL REGENERATION FOR 30 YEARS	
SALE NAME	AFC <u>86-90</u>	PERIOD OF LOGGING <u>1990-2000</u>	NO SNAGS	
PHOTO LINE AND NUMBER	<u>37 276 341</u>	SECOND THINNING <u>1995-2000</u>	NO SELECTIVE LOGGING	
OBJECTIVES	Woke south boundary of unit + the stream	GOAL TO CONSERVE BIODIVERSITY	NO CLEARCUTTING	
		SOILS	HIGH HAZARD AREA	OBJECTIVE / PRESCRIPTION: <u>Exact specs of unit identified</u>
		RESULTS OF MONITORING:		
		ROAD LOCATION AND OBJECTIVE	CLOSED ROAD — DISCOURAGE TRAVEL	OPEN ROAD — ALL ROADS CROSSED CLOSED
		FISHERIES / HYDROLOGY	CLASS I CROSSING — FHMU <u>✓</u> TEMPERATURE SENSITIVITY: YES <u>NO</u>	CLASS III CROSSING — NO ↗ CHANNEL
		OBJECTIVE / PRESCRIPTION:	<u>Hydro input needed. 1/2 channel.</u>	
PLANNED (AERIAL PHOTO)		SCALE: <u>1:5646</u>	WILDLIFE	IN HABITAT FOR OLD GROWTH SPECIES <u>NO</u>
			OK	VISUAL RECREATION
			Unit meets assigned VQO & Modification SEE ATTACHED	OBJECTIVE / PRESCRIPTION:
				KNOWN SITE <u> </u> PROBABILITY ZONE: HIGH — MEDIUM —
				OBJECTIVE / PRESCRIPTION:
		LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION: <u>High and low, cell and road away from stream banks.</u>	
		REMARKS	<u>Recreation; see attached</u>	
				

What is the real unit size?

FETS JOL-1293

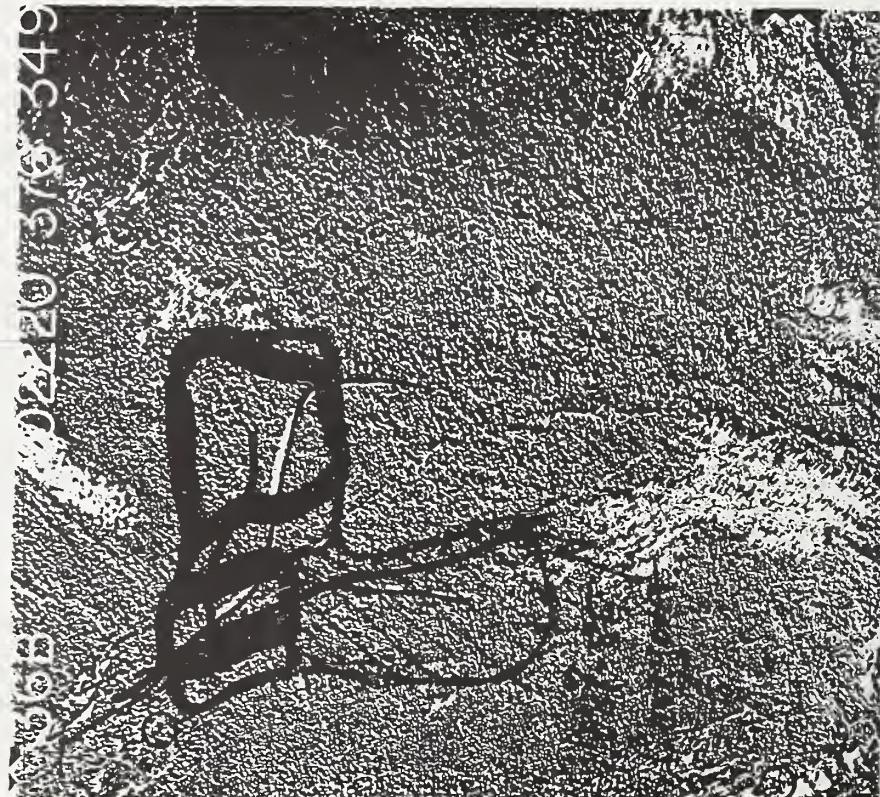
VCU 214

EIS UNIT # 3 - SERIALIZED " Seal Ck 1293  
SALE NAME Afr PHOTO LINE AND NUMBER 36B 376 349 554

OBJECTIVES

Deforested blowdown portion of C.C.  
in unit 186. Picked up leave strip between  
units 3 and 4. Split sections and sell.

PLANNED (AERIAL PHOTO)



SILVICULTURE		OBJECTIVE / PRESCRIPTION: Follow for natural regeneration following monitoring timber harvest. When harvesting leave at least YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> Two snags/acre for diversity. This stand has a site INDEX OF 100 - RAN A PCT @ 12-18 years with a timber RESULTS OF MONITORING: VMT 9-8-89
SOILS		OBJECTIVE / PRESCRIPTION:
MONITORING		YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>
WATERSHED		OBJECTIVE / PRESCRIPTION:
MONITORING		YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>
FISHERIES		OBJECTIVE / PRESCRIPTION:
MONITORING		YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>
WILDLIFE		OBJECTIVE / PRESCRIPTION: See attached
MONITORING		YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> Large unit size will restrict future options to manage timber and maintain habitat diversity & dispersion between units.
VISUAL RECREATION		OBJECTIVE / PRESCRIPTION: SEE ATTACHED Unit meets agency VRO of Mar. Mod.
MONITORING		YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>
CULTURAL		OBJECTIVE / PRESCRIPTION:
MONITORING		YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>
LOGGING SYSTEM		OBJECTIVE / PRESCRIPTION: If lead yard, no concerns
MONITORING		YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>
ROAD LOCATION AND CONSTRUCTION		OBJECTIVE / PRESCRIPTION: Discourage vehicle traffic YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> Allow to grow closed
		RESULTS OF MONITORING: Recreation see attached

## 86 - 90 UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED ( AS PER 86-90 FEIS )

VCU 214 EIS UNIT # 16	LOGGING SYSTEM #	SILVICULTURE	OBJECTIVE / PRESCRIPTION:
STAND # 36 - 90	VOLUME FEIS 474	VOLUME CRUISE —	Review by silvics for possible planting following harvest.
PHOTO LINE AND NUMBER 3613	376 - 350		100% Pol Hugh (55-100). Ave Site index is 65 (Fair) Monitor regrowth and P.R.
<b>OBJECTIVES</b>		SOILS	HIGH HAZARD AREA None identified
			OBJECTIVE / PRESCRIPTION: at ages 12-18 with wildlife emphasis retain an area of 2 sharp turns
			in air gap
			JMR 78
<b>PLANNED (AERIAL PHOTO)</b>		SCALE : 15840	RESULTS OF MONITORING: ROAD LOCATION CLOSED ROAD — OPEN ROAD — AND OBJECTIVE DISCONTINUE DRIVE TO GROWTH Closed
			FISHERIES / HYDROLOGY CLASS I CROSSING — CLASS II CROSSING — CLASS III CROSSING — FHMU A TEMPERATURE SENSITIVITY: YES — NO OBJECTIVE / PRESCRIPTION: Fish stream on west boundary; implement C 145 A prescription. Fisheries input needed.
			WILDLIFE IN HABITAT FOR OLD GROWTH SPECIES YES (See attached) OBJECTIVE / PRESCRIPTION: 21 ac. ea. old growth & deer unit located entirely within Habitat for Old Growth dependent species & in Deer winter range. Best unit size in emphasis species habitat is 10 acres or less.
			VISUAL RECREATION OBJECTIVE / PRESCRIPTION: Unit meets Assured VQO of Maximum Modification SEE ATTACHED
		CULTURAL	KNOWN SITE — PROBABILITY ZONE : HIGH — MEDIUM — OBJECTIVE / PRESCRIPTION :
		LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION: Hillhead yard; Fall on & year away from Stream bank
		<b>REMARKS</b> Recreation: See Attached	



Overall land by natural regeneration, productivity range from 100% Pol Hugh (55-100). Ave Site index is 65 (Fair) Monitor regrowth and P.R.

at ages 12-18 with wildlife emphasis retain an area of 2 sharp turns

in air gap

JMR 78

an area of 2 sharp turns

in air gap

in air gap

Sale Name SE - CREEK

DESCRIPTION OF UNIT LAYOUT

Designed by \_\_\_\_\_ Date \_\_\_\_\_

Laid out by J Streule Date 9/85 unit 186

Photo Number 36B-348 Unit Diagrams \_\_\_\_\_ Unit Number \_\_\_\_\_

Show: System roads; temporary roads; cutting lines; junction stations; landings; percent slope from cutting line to landing for downhill yarding; uphill yarding; splitlines; streams to be protected; areas requiring special yarding instructions (partial or full suspension etc.); true north orientation; tie in of traverse lines, skyline profile and number.

As planned:

N  
↑



Designed by \_\_\_\_\_ Date \_\_\_\_\_  
Laid out by J Strelak, B. Nowak Date 6-28-88  
Photo Number 37-341 Unit Diagrams \_\_\_\_\_ Holt Number 7189(89)

Show: System roads; temporary roads; cutting lines; junction stations; landings; percent slope from cutting line to landing for downhill yarding; uphill yarding; splitlines; streams to be protected; areas Vol= requiring special yarding instructions (partial or full suspension, etc.); true north orientation; tie in of traverse lines, skyline profile and number.

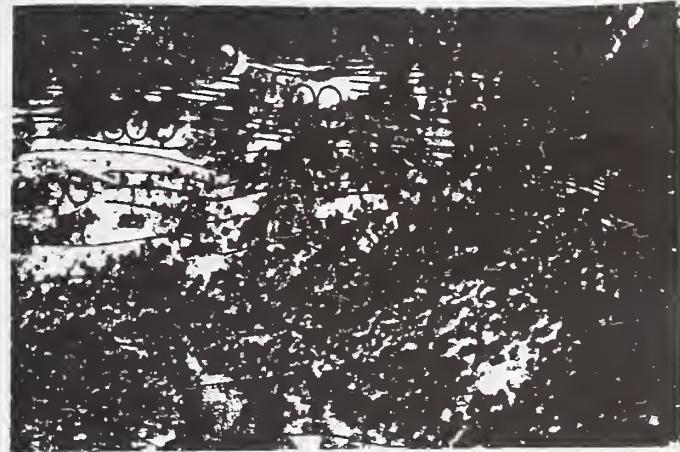
As planned:

N  
↑



As laid out:

7" = 1,000'



NOTE: SALE ADMIN CONNECTED  
UNIT 189 TO UNIT 2 TO  
REFLECT THE "AS PLANNED"  
SCHEME - THIS AT APC'S  
REQUEST. HARVEST HAS STARTED  
RECENTLY. JPT 9-8-89

Discuss departures from original photo layout:

Unit 189 is now part of Unit 2 to  
blowdown and road. 12'-20' tall.  
The 189 unit is completely  
deleted and the 2 unit is  
now 12'-18' tall due to a slight reagent  
shift. It is part of Unit 2 due to blowdown  
with Unit 189 recent.

ACTUAL UNIT CONFIGURATION  
WILL PROBABLY MORE CLOSELY  
REFLECT THE "PLANNED" UNIT  
DRAWING AS SHOWN ON THE  
214/2 (86-90) PLANNED UNIT  
LAYOUT CURD (i.e. UNIT 189  
IS DRAWN IN TO THE LEFT OF  
UNIT 2) JPT. 9-8-89

Sale Name SEAL CREEK

DESCRIPTION OF UNIT LAYOUT

Designed by \_\_\_\_\_ Date \_\_\_\_\_

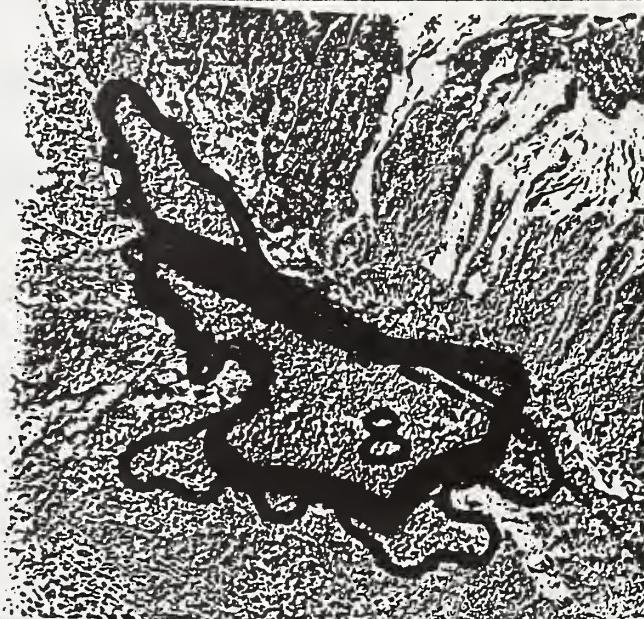
Laid out by J. St...G. Date 7/22

Photo Number 36B-348 Unit Diagrams \_\_\_\_\_ Unit Number 8190 (190)

Show: System roads; temporary roads; cutting lines; junction stations; landings; percent slope from cutting line to landing for downhill yarding; uphill yarding; splitlines; streams to be protected; areas requiring special yarding instructions (partial or full suspension, etc.); true north orientation; tie in of traverse lines, skyline profile and number.

As planned:

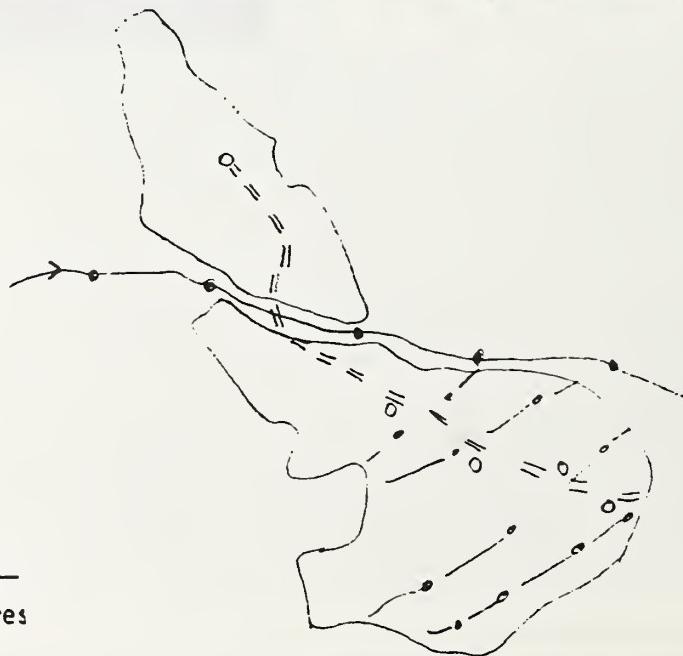
N  
↑



As laid out:

Scale 1"=1000 0 1 2"

780-



Discuss departures

**86 - 90 UNIT 4 Layout and Road Location Card - PLANNED (AS PER 86-90 FEIS)**

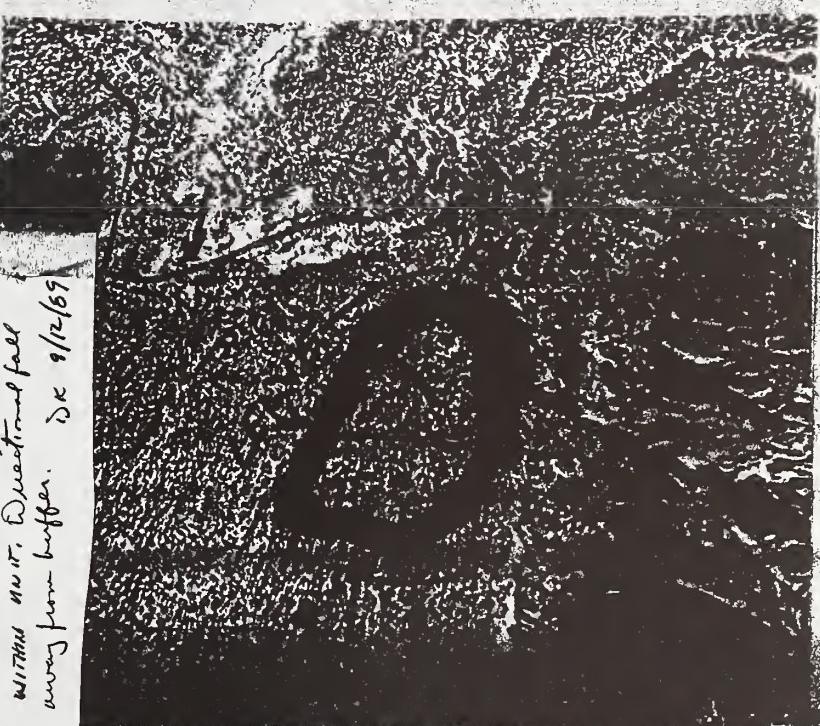
EIS UNIT # 5 ACRES 59 LOGGING SYSTEM H/L  
 VOLUME FEIS 1277 VOLUME CRUISE —  
 APC 86-90 At J  
 LINE AND NUMBER 32B 1176 144

FISHERIES / HYDROLOGY

PROTECT CLASS II STREAM CHANNEL.  
 MAINTAIN 50' BUFFER ALONG SOUTH  
 Boundary line w/ Valley bottom  
 CHANNEL.

PROTECT CLASS III STREAM WATER  
 QUALITY. DETERMINATE FALLING AT  
 RIGHT ANGLES TO V-WORL CHANNELS  
 WITHIN 50'. DETERMINE fall  
 away from buffer. JDC 9/12/69

EIS UNIT # <u>5</u>	ACRES <u>59</u>	LOGGING SYSTEM <u>H/L</u>	SILVICULTURE	OBJECTIVE / PRESCRIPTION:
VOLUME FEIS <u>1277</u>	VOLUME CRUISE <u>—</u>		Plan to this portion of the unit (up to the break in slope) to spruce soon after the clearcutting of this unit. Allow the slope to regenerate naturally. Schedule a PCT @ 12-18 years for the unit with timber objectives as this is a highly productive site (~S.I. > 75 FMS DO, 95% DO).	High hazard area
APC <u>86-90</u>	At <u>J</u>			Objective / Prescription: leave all trees identified
LINE AND NUMBER <u>32B</u> <u>1176 144</u>				2 squares/mile for old growth review
JPT 9-5-78				
REASON OF MONITORING:				
ROAD LOCATION	CLOSED ROAD	OPEN ROAD	OPEN ROAD	OBJECTIVE / PRESCRIPTION:
END OBJECTIVE				
<u>Block off from humans</u>				
SCALE: <u>1:158840</u>				
FISHES / HYDROLOGY				
CLASS I CROSSING	CLASS II CROSSING	CLASS III CROSSING		
TEMPERATURE SENSITIVITY: YES	NO			
POTENTIAL HABITAT: Stream to soil of unit listed as Class A				
FISH review needed. U-nativeness within unit, potential habitat				
WILDLIFE	HABITAT FOR OLD GROWTH SPECIES	<u>HO</u>	(see attached)	
	OBJECTIVE / PRESCRIPTION:			
JPT 9-5-78				
VEHICLE RECEISSION	OBJECTIVE / PRESCRIPTION:			
Unit must be Atticulated	Assigned YQO of Maximum Modification			
CLUTTER	NON SITE	PROBABILITY ZONE: HIGH — MEDIUM		
LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION:			
	away from Stream bed			
RESULTS	Review: See attached			



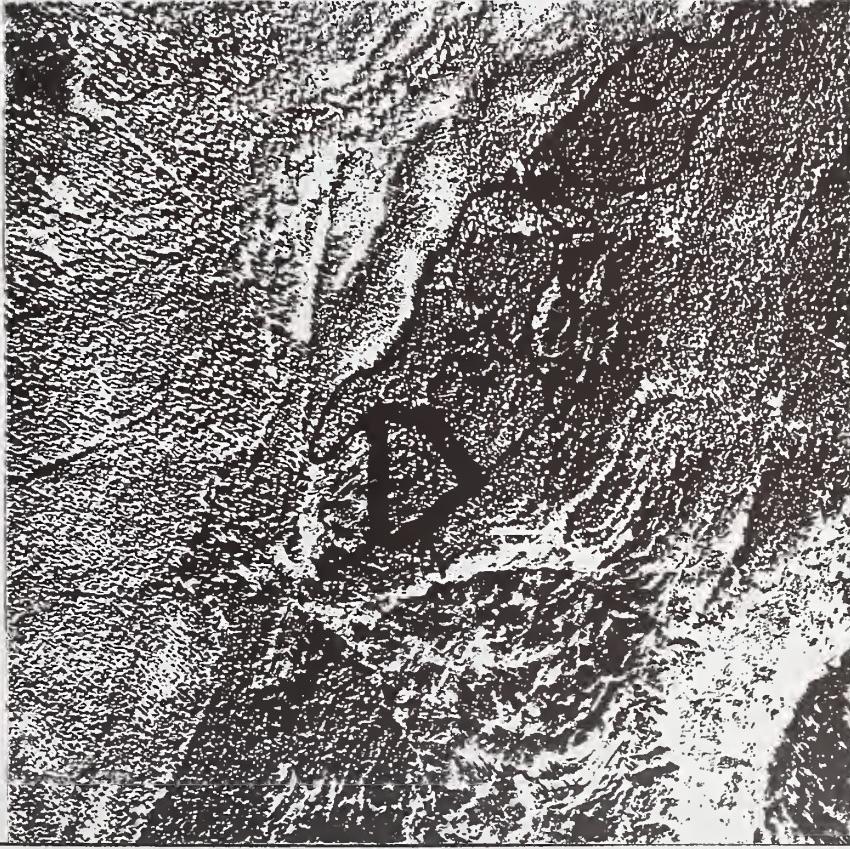
## 47 UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED

(AS PER 86-90 FEIS)

VOLUME	EIS UNIT #	6	LOGGING SYSTEM	H2	SILVICULTURE	OBJECTIVE / PRESCRIPTION:
ST.	VOLUME FEIS	1117	VOLUME CRUISE	—	HARVEST	CLEARCUT AND REGENERATE NATURALLY. DURING THE HARVEST, ISSUE AT LEAST 2 SMALLS/ACRE AND ANY CLIMS OF ADVANCED REGROWTH. SCHEDULE A PCT @ 12-18 YEARS WITH TIMBER OBJECTIVES.
ST. NAME	APC 86-90	APC #	K	94	PERIOD	12-18 YEARS
FEIS LINE AND NUMBER	32B	1176-144	3657-11-3524070	3657-11-3524070	FOR THE ENTIRE UNIT.	JPT 9-9-89
OBJECTIVES						
SOILS	HIGH HAZARD AREA —					OBJECTIVE / PRESCRIPTION:
REASON: <i>Zone 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 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599, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000, 1001, 1002, 1003, 1004, 1005, 1006, 1007, 1008, 1009, 1000, 1001, 1002, 1003, 1004, 1005, 1006, 1007, 1008, 1009, 1010, 1011, 1012, 1013, 1014, 1015, 1016, 1017, 1018, 1019, 1010, 1011, 1012, 1013, 1014, 1015, 1016, 1017, 1018, 1019, 1020, 1021, 1022, 1023, 1024, 1025, 1026, 1027, 1028, 1029, 1020, 1021, 1022, 1023, 1024, 1025, 1026, 1027, 1028, 1029, 1030, 1031, 1032, 1033, 1034, 1035, 1036, 1037, 1038, 1039, 1030, 1031, 1032, 1033, 1034, 1035, 1036, 1037, 1038, 1039, 1040, 1041, 1042, 1043, 1044, 1045, 1046, 1047, 1048, 1049, 1040, 1041, 1042, 1043, 1044, 1045, 1046, 1047, 1048, 1049, 1050, 1051, 1052, 1053, 1054, 1055, 1056, 1057, 1058, 1059, 1050, 1051, 1052, 1053, 1054, 1055, 1056, 1057, 1058, 1059, 1060, 1061, 1062, 1063, 1064, 1065, 1066, 1067, 1068, 1069, 1060, 1061, 1062, 1063, 1064, 1065, 1066, 1067, 1068, 1069, 1070, 1071, 1072, 1073, 1074, 1075, 1076, 1077, 1078, 1079, 1070, 1071, 1072, 1073, 1074, 1075, 1076, 1077, 1078, 1079, 1080, 1081, 1082, 1083, 1084, 1085, 1086, 1087, 1088, 1089, 1080, 1081, 1082, 1083, 1084, 1085, 1086, 1087, 1088, 1089, 1090, 1091, 1092, 1093, 1094, 1095, 1096, 1097, 1098, 1099, 1090, 1091, 1092, 1093, 1094, 1095, 1096, 1097, 1098, 1099, 1100, 1101, 1102, 1103, 1104, 1105, 1106, 1107, 1108, 1109, 1100, 1101, 1102, 1103, 1104, 1105, 1106, 1107, 1108, 1109, 1110, 1111, 1112, 1113, 1114, 1115, 1116, 1117, 1118, 1119, 1110, 1111, 1112, 1113, 1114, 1115, 1116, 1117, 1118, 1119, 1120, 1121, 1122, 1123, 1124, 1125, 1126, 1127, 1128, 1129, 1120, 1121, 1122, 1123, 1124, 1125, 1126, 1127, 1128, 1129, 1130, 1131, 1132, 1133, 1134, 1135, 1136, 1137, 1138, 1139, 1130, 1131, 1132, 1133, 1134, 1135, 1136, 1137, 1138, 1139, 1140, 1141, 1142, 1143, 1144, 1145, 1146, 1147, 1148, 1149, 1140, 1141, 1142, 1143, 1144, 1145, 1146, 1147, 1148, 1149, 1150, 1151, 1152, 1153, 1154, 1155, 1156, 1157, 1158, 1159, 1150, 1151, 1152, 1153, 1154, 1155, 1156, 1157, 1158, 1159, 1160, 1161, 1162, 1163, 1164, 1165, 1166, 1167, 1168, 1169, 1160, 1161, 1162, 1163, 1164, 1165, 1166, 1167, 1168, 1169, 1170, 1171, 1172, 1173, 1174, 1175, 1176, 1177, 1178, 1179, 1170, 1171, 1172, 1173, 1174, 1175, 1176, 1177, 1178, 1179, 1180, 1181, 1182, 1183, 1184, 1185, 1186, 1187, 1188, 1189, 1180, 1181, 1182, 1183, 1184, 1185, 1186, 1187, 1188, 1189, 1190, 1191, 1192, 1193, 1194, 1195, 1196, 1197, 1198, 1199, 1190, 1191, 1192, 1193, 1194, 1195, 1196, 1197, 1198, 1199, 1200, 1201, 1202, 1203, 1204, 1205, 1206, 1207, 1208, 1209, 1200, 1201, 1202, 1203, 1204, 1205, 1206, 1207, 1208, 1209, 1210, 1211, 1212, 1213, 1214, 1215, 1216, 1217, 1218, 1219, 1210, 1211, 1212, 1213, 1214, 1215, 1216, 1217, 1218, 1219, 1220, 1221, 1222, 1223, 1224, 1225, 1226, 1227, 1228, 1229, 1220, 1221, 1222, 1223, 1224, 1225, 1226, 1227, 1228, 1229, 1230, 1231, 1232, 1233, 1234, 1235, 1236, 1237, 1238, 1239, 1230, 1231, 1232, 1233, 1234, 1235, 1236, 1237, 1238, 1239, 1240, 1241, 1242, 1243, 1244, 1245, 1246, 1247, 1248, 1249, 1240, 1241, 1242, 1243, 1244, 1245, 1246, 1247, 1248, 1249, 1250, 1251, 1252, 1253, 1254, 1255, 1256, 1257, 1258, 1259, 1250, 1251, 1252, 1253, 1254, 1255, 1256, 1257, 1258, 1259, 1260, 1261, 1262, 1263, 1264, 1265, 1266, 1267, 1268, 1269, 1260, 1261, 1262, 1263, 1264, 1265, 1266, 1267, 1268, 1269, 1270, 1271, 1272, 1273, 1274, 1275, 1276, 1277, 1278, 1279, 1270, 1271, 1272, 1273, 1274, 1275, 1276, 1277, 1278, 1279, 1280, 1281, 1282, 1283, 1284, 1285, 1286, 1287, 1288, 1289, 1280, 1281, 1282, 1283, 1284, 1285, 1286, 1287, 1288, 1289, 1290, 1291, 1292, 1293, 1294, 1295, 1296, 1297, 1298, 1299, 1290, 1291, 1292, 1293, 1294, 1295, 1296, 1297, 1298, 1299, 1300, 1301, 1302, 1303, 1304, 1305, 1306, 1307, 1308, 1309, 1300, 1301, 1302, 1303, 1304, 1305, 1306, 1307, 1308, 1309, 1310, 1311, 1312, 1313, 1314, 1315, 1316, 1317, 1318, 1319, 1310, 1311, 1312, 1313, 1314, 1315, 1316, 1317, 1318, 1319, 1320, 1321, 1322, 1323, 1324, 1325, 1326, 1327, 132</i>						

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### 81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)

EIS UNIT #	ACRES	LOGGING SYSTEM	SILVICULTURE	OBJECTIVE / PRESCRIPTION:		
215	8	11	11	THIS UNIT IS ADJACENT TO UNIT 159. AT THIS POINT IN TIME, ONLY ACREAGE OF ACRES HAVE BEEN CUT IN UNIT 159. WITH THESE TWO UNITS COMBINED, TOTAL CUT AREA WILL EQUAL 50 ACRES. AT THE WEST END OF UNIT 159, IS AN ALDER BRUSH FIELD (SMALL IN SIZE). THERE IS A GOOD SEED SOURCE ABOVE THIS BRUSH FIELD AND ACROSS THE 8 SOIL ROAD ON THE PLATEAU, SO ALLOW FOR NATURAL REGEN FOLLOWING CLEAR CUTTING. DURING THE NEXT 10 YEARS, INVESTIGATE LEAVE AT LEAST TWO SQUARES/ACRE FOR DIVERSITY. SITE NUMBER EMPHASIS. THIS IS A HIGH PRODUCTIVITY SITE JPT 9-9-89		
STAND #	VOLUME FEIS	176	VOLUME CRUISE			
SALE NAME	FRESH H2O	Main Road Operates General traffic				
PHOTO LINE AND NUMBER	FLT 31 - 1176 # 168-169					
RESULTS OF MONITORING:						
PLANNED (ORTHO PHOTO)		SCALE:	ROAD LOCATION CLOSED ROAD — OPEN ROAD — OBJECTIVE / PRESCRIPTION:			
			Main Road			
						
OBJECTIVE / PRESCRIPTION:						
FISHERIES / HYDROLOGY		CLASS I CROSSING	CLASS II CROSSING	CLASS III CROSSING		
		FWHU	X	TEMPERATURE SENSITIVITY: YES	NO	
OBJECTIVE / PRESCRIPTION:		No concerns identified. DK 8/12/87				
WILDLIFE		IN HABITAT FOR OLD GROWTH SPECIES <u>NO</u> (see attached)				
OBJECTIVE / PRESCRIPTION:		<i>Good Silvicultural Rx to maintain wildlife values.</i>				
		Good unit size to provide for habitat diversity. Unit is adjacent to riparian habitat.				
VISUAL		OBJECTIVE / PRESCRIPTION:				
RECREATION		<i>Unit meets assigned VPO of Max. Mod.</i>				
CULTURAL		KNOWN SITE PROBABILITY ZONE: HIGH — MEDIUM —				
LOGGING SYSTEM		OBJECTIVE / PRESCRIPTION: Head Yard. No concerns				
REMARKS: Recreation! See Attached						
OBJECTIVE / PRESCRIPTION:						
SOILS						
HIGHEST HAZARD AREA						
OBJECTIVE / PRESCRIPTION:						

**86 - 90 UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 86-90 FEIS)**

VOLUME	EIS UNIT # 12	LOGGING SYSTEM H-L	SILVICULTURE	OBJECTIVE / PRESCRIPTION:
STATION	VOLUME FEIS 924	VOLUME CRUISE —	DUE TO PRECIPITATION BEACH LOGGING & UNDRAWD ARE SCATTERED THROUGHOUT THIS UNIT. THE PRACTICAL DURING HARVEST, LEAVE THESE POCKETS FOR STRAND FORESTS. IN THE FUTURE, TAK ADDITIONALLY, LEAVING 2 SWAGS, THESE POCKETS, BANT THE CROWN, AND IN THE FUTURE, LEAVING 2 SWAGS, THESE POCKETS, AFTER ARRIVED, AND THE REMAINING ACTIONS OF THE UNIT TO NATURALLY	ADVANCED REGEN & 2nd GROWTH MATERIALS. POCKETS OF ADVANCED REGEN & 2nd GROWTH ARE SCATTERED THROUGHOUT THIS UNIT. THE PRACTICAL DURING HARVEST, LEAVE THESE POCKETS FOR STRAND FORESTS. IN THE FUTURE, TAK ADDITIONALLY, LEAVING 2 SWAGS, THESE POCKETS, BANT THE CROWN, AND IN THE FUTURE, LEAVING 2 SWAGS, THESE POCKETS, AFTER ARRIVED, AND THE REMAINING ACTIONS OF THE UNIT TO NATURALLY
STATION NAME	ARC 86-90	A/P 86 12H	SOILS	HIGH HAZARD AREA — OBJECTIVE / PRESCRIPTION:
PLOT LINE AND NUMBER	36 0	376-350		NO SITE LINES
OBJECTIVES	Deleted portion of unit below road			
SILVICULTURE (CONT'D)	REGENERATE. THIS IS A HIGHLY PRODUCTIVE SITE (S.I. > 95%) BUT A FACT @ 12 to 18 WITH BOTH A WILDLIFE + TIMBER EMPHASIS.			
	JPT 9-8-89			
WILDLIFE	FISHES	CLASS II CROSSING — CLASS III CROSSING —	ROAD EROSION CONTROL ROAD — OPEN ROAD	OBJECTIVE / PRESCRIPTION:
WILDLIFE	WILDLIFE	FRONTAGE TEMPERATURE SENSITIVITY: YES — NO		NO CONCERN IDENTIFIED
WILDLIFE	WILDLIFE	SELECTION / PRESCRIPTION: No concerns identified. Lack of habitat approvals by specialist.		Lack of habitat approvals by specialist.
WILDLIFE	WILDLIFE	IN HABITAT FOR OLD GROWTH SPECIES YES (See attached OBJECTIVE / PRESCRIPTION: Best unit size in emphasis spec) No effects — small unit with 150' buffer or on back edge. This cannot be an impacted clearing. The visual variance given by EWS, (detected RECREATION		old growth grass
WILDLIFE	WILDLIFE	Unit effects will assigned VQO f. Modification (small) near beach front & lower back line if possible. SEE ATTACHED		PROBABILITY ZONE: HIGH — MEDIUM
CULTURAL	CULTURAL	KNOWN SITE —	OBJECTIVE / PRESCRIPTION:	
LOCALITY SYSTEM	LOCALITY SYSTEM	OBJECTIVE / PRESCRIPTION: Cut across densitified yard no species		
				Preservation: See attached

911

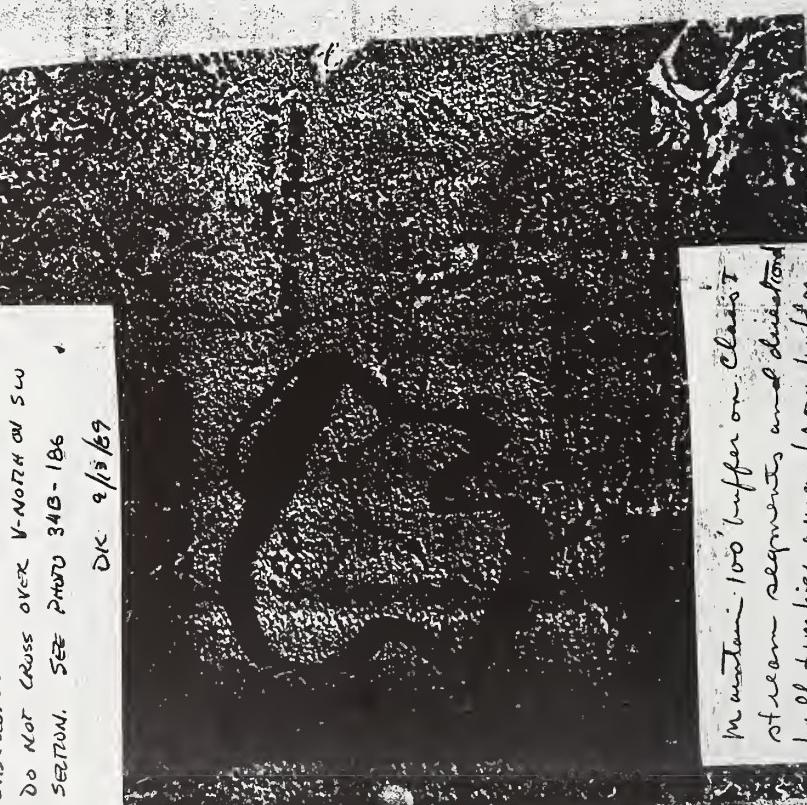
**86-90 UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 86-90 FEIS)**

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## 86-90 UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 86-90 FEIS)

EIS UNIT # <u>16</u>	ACRES <u>47.108</u>	LOGGING SYSTEM <u>HL</u>	SILVICULTURE OBJECTIVE / PRESCRIPTION: CLEARCUT + REGENERATE NATURALLY. MONITOR THE CENTER OF THE LINE FOR POTENTIAL REGEN PROBLEMS (TOBQUARRY + DISTANCE FROM SEED WOOD). DURING HARVEST, LEAVE AT LEAST 2.5 WAGS/ACRE CLUSTERS OF ADVANCED REGEN FOR STAND DIVERSITY. AS TREES MATURE, LOG IN SUCCESSION. AFTER 12-18 YEARS OF MEDIUM PREDOMINANTLY (S.I. > 80%), LOG IN WILDLIFE OBJECTIVES (S.I. > 70%).
DATE <u>86-90</u>	VOLUME FEIS <u>2823</u>	VOLUME CRUISE <u>—</u>	ROAD LOCATION <u>CLOSED ROAD</u>
LINE AND NUMBER <u>34B 376-181</u>	ARC # <u>16</u>	OBJECTIVE / PRESCRIPTION: <u>Break to Public Trail or Road</u>	OPEN ROAD
NOTES: Should bridge crossing to S. of units be feasible, timber would have to be hauled R.R. to the Northwest.	SOILS <u>—</u>	OBJECTIVE / PRESCRIPTION: <u>Break to Public Trail or Road</u>	OPEN ROAD
RESULTS OF MONITORING:	SCALE: <u>1:15,900</u>	WILDLIFE HABITAT FOR OLD GROWTH SPECIES <u>YES</u> (see attached)	CLASS I CROSSING — CLASS II CROSSING — CLASS III CROSSING —
ROAD LOCATION <u>CLOSED ROAD</u>	ROAD LOCATION <u>CLOSED ROAD</u>	OBJECTIVE / PRESCRIPTION: FINN M. TEMPERATURE SENSITIVITY: YES NO LOGGING: If 16 can be logged to stream on site, then Class A prescriptions will be needed. Fish review needed.	NO
AND OBJECTIVE <u>Break to Public Trail or Road</u>	AND OBJECTIVE <u>Break to Public Trail or Road</u>	WILDLIFE HABITAT FOR OLD GROWTH SPECIES <u>YES</u> (see attached)	WILDLIFE HABITAT FOR OLD GROWTH SPECIES <u>YES</u> (see attached)
FISHERIES / HYDROLOGY:	WATER BODY <u>34B-186</u>	WILDLIFE HABITAT FOR OLD GROWTH SPECIES <u>YES</u> (see attached)	WILDLIFE HABITAT FOR OLD GROWTH SPECIES <u>YES</u> (see attached)
FLAW III	SECTION / PRESCRIPTION: If 16 can be logged to stream on site, then Class A prescriptions will be needed. Fish review needed.	WILDLIFE HABITAT FOR OLD GROWTH SPECIES <u>YES</u> (see attached)	WILDLIFE HABITAT FOR OLD GROWTH SPECIES <u>YES</u> (see attached)
DO NOT CROSS OVER V-NORTH OR S-LU PULL OUT BOUNDARIES BACK FROM SIDESLOPES OF V-NORTH, NE SECTION. DO NOT CROSS OVER V-NORTH OR S-LU SECTION. SEE PHOTO 34B-186	SIZE: <u>108 ac.</u>	WILDLIFE HABITAT FOR OLD GROWTH SPECIES <u>YES</u> (see attached)	WILDLIFE HABITAT FOR OLD GROWTH SPECIES <u>YES</u> (see attached)
DK <u>9/3/89</u>	RECREATION: <u>SET ATTACHED</u>	VISUAL RECREATION: <u>SET ATTACHED</u>	VISUAL RECREATION: <u>SET ATTACHED</u>
CULTURAL: <u>—</u>	KNOWN SITE <u>—</u>	PROBABILITY ZONE: <u>HIGH — MEDIUM</u>	LOGGING SYSTEM: <u>Need to extend road to bridge to log to creek, etc. down to point of cut.</u>
REMARKS: <u>Maintain 100' buffer on class I stream segments and directed fuel timber away from buffer</u>	OBJECTIVE / PRESCRIPTION: Felled roadway from stream	OBJECTIVE / PRESCRIPTION: Log + logging inflexible	OBJECTIVE / PRESCRIPTION: Log + logging inflexible

Attachment 5b, attached - Potential camp areas



SL-11-81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)

VCU 215	EIS UNIT # 04117	ACRES 60	LOGGING SYSTEM H/L	SILVICULTURE	OBJECTIVE / PRESCRIPTION: CLEAR CUT AND REGENERATE NATURALLY. DURING TIMBER HARVEST, KEEVE AT LEAST 2 SWATHS AND ANY ADDED REGEN FOR STAND DIVERSITY. THIS UNIT IS OF MEDULLY PRODUCITV (~80 S.I.-FAR) BUT HAS WILDLIFE VALUES - DEER WINTER RANGE & BEAR TRAVEL CORRIDOR. A PCT @ 12-18yo WITH WILDLIFE OBJECTIVES.
STAND #	VOLUME FEIS	1087	VOLUME CRUISE		JET - 9-8-89
SALE NAME					
PHOTO LINE AND NUMBER		34B - 18/			
OBJECTIVES		HIGH HAZARD AREA			OBJECTIVE / PRESCRIPTION:
RESULTS OF MONITORING:					
ROAD LOCATION AND OBJECTIVE		CLOSED ROAD	OPEN ROAD	OBJECTIVE / PRESCRIPTION: Control vehicle traffic off road	
PLANNED (ORTHO PHOTO)		SCALE: _____			
FISHERIES / HYDROLOGY	CLASS I CROSSING	CLASS II CROSSING	CLASS III CROSSING		
FMNU	TEMPERATURE SENSITIVITY: YES	NO	WITH 100' BUFFER		
OBJECTIVE / PRESCRIPTION: PROTECT CLASS 2 STREAM CHANNEL. NORMAL STREAM TO PROTECT STREAM CHANNEL. SEE NEW MAP.					D K 9/12/89
WILDLIFE		IN HABITAT FOR OLD GROWTH SPECIES	YES (See attached)		
OBJECTIVE / PRESCRIPTION: Best unit size to provide for deer winter range and old growth habitat values is 10 acres or less. 60ac. Durk 30ac. Old growth					
VISUAL RECREATION	OBJECTIVE / PRESCRIPTION: SEE ATTACHED				
CULTURAL	KNOWN SITE	PROBABILITY ZONE: HIGH	MEDIUM		
LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION: H/L end yard. Fall and yard away from stream				
REMARKS		Recreation! See Attached. Potential Campground. Freshwater Bay - Timp			
					

Date 81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS.)

VCU	215	EIS UNIT	60	ACRES	63.86	LOGGING SYSTEM	II	SILVICULTURE	OBJECTIVE / PRESCRIPTION: Clean cut harvested followed by natural regeneration on slopes ≤ 20%. This is a high site (Favor 100), slow logging on NE side of creek. Possible subsidence station on south side of road. Monitor regrade & recommend thin at a grade 12-18 with a timber analysis. Retain some old growth stands per acre for diversity.
STAND *		VOLUME FEIS	1744	VOLUME CRUISE	2383				
SALE NAME	A4 03								
PHOTO LINE AND NUMBER		33B	- 157						
OBJECTIVES	Provide volume for the 86-90 operating period.								

PLANNED (ORTHO PHOTO) SCALE: \_\_\_\_\_



RESULTS OF MONITORING:

ROAD LOCATION AND OBJECTIVE	CLOSED ROAD — OPEN ROAD	OBJECTIVE / PRESCRIPTION:
Controlled traffic vehicles	Open Road	Objective / Prescription: None
WILDLIFE		
FISHERIES / HYDROLOGY	CLASS I CROSSING — CLASS II CROSSING — CLASS III CROSSING —	
OBJECTION / PRESCRIPTION: Protect Class I Stream Channel / maintain pool, buffer areas, monitor line with valley bottom stream. Priority lines II stream channel (High, High SSI, buffer areas, south east line of old growth from buffer to stream). Do not log sides of lines.		
RECREATION	IN HABITAT FOR OLD GROWTH SPECIES Yes (See attached)	OBJECTIVE / PRESCRIPTION:
	Best unit size to manage "old growth like" habitat diversity is 10 acres or less. 10ac. Riparian 86 ac. Old growth	
VISUAL	OBJECTIVE / PRESCRIPTION: SEE ATTACHED	
CULTURAL	KNOWN SITE — PROBABILITY ZONE: HIGH — MEDIUM —	OBJECTIVE / PRESCRIPTION:
LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION: High lead yard away from stream buffer	
REMARKS	Recreation See Attached	

Date

## 81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)

YCU <u>215</u>	EIS UNIT # <u>63</u>	ACRES <u>.30</u>	LOGGING SYSTEM <u>C-L</u>	SILVICULTURE OBJECTIVE / PRESCRIPTION: Cleared by hand following up the artificial ridge line area (Sitta Spur) - Succeeding up the Highly productive Site (Pan 100). Retain an ave. of 2 snags per acre for diversity.
STAND # <u>1A</u>	VOLUME FEIS <u>798</u>	VOLUME CRUISE <u>—</u>		
SALE NAME <u>AIA 03</u>	PHOTO LINE AND NUMBER <u>34A - 179</u>			
<u>OBJECTIVES</u> Provide jobs/me for the 86-90 operating		<u>SOILS</u>	<u>HIGH HAZARD AREA</u>	<u>OBJECTIVE / PRESCRIPTION:</u>
		<u>5.1A 19 3</u>		
RESULTS OF MONITORING:				
ROAD LOCATION AND OBJECTIVE	CLOSED ROAD	OPEN ROAD	OBJECTIVE / PRESCRIPTION: Central Ordinance tree after houses	
<u>Gold Branch Concentration heads to recess under Rock on Sun Face</u>				
FISHERIES / HYDROLOGY	CLASS I CROSSING	CLASS II CROSSING	CLASS III CROSSING	
FHMU 17 TEMPERATURE SENSITIVITY: YES NO				
OBJECTIVE / PRESCRIPTION: Protect CLASS II stream channel integrity. Maintain 50' buffer along boundary with stream channel. Do not cut fuel away from buffer. DK 9/12/69				
WILDLIFE	IN HABITAT FOR OLD GROWTH SPECIES <u>NO</u> (See attached) OBJECTIVE / PRESCRIPTION:			
VISUAL RECREATION	OBJECTIVE / PRESCRIPTION: SEE ATTACHED ASSISTED VPO MODIFICATION Unit matto crawler VPO			
CULTURAL	KNOWN SITE	PROBABILITY ZONE	HIGH — MEDIUM —	OBJECTIVE / PRESCRIPTION:
LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION: 1/1/ land yard Fall and yard away from Stream Bank			
REMARKS <u>Retention: See Attached</u>				
				

Date 81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)

VCU 215	EIS UNIT # 64	ACRES 35	LOGGING SYSTEM <u>HLL</u>	SILVICULTURE OBJECTIVE / PRESCRIPTION: Clear cut harvest followed by artificial regeneration to Sitka spruce - re-justify of poor seed wall. This is a high prod. site (Farr 100). Retain an acre range of 2 sugars per acre for diversity. Inclusion of Sitka Alder within watershed will be included in the acreage calculation.
STAND #	VOLUME FEIS	9.31	VOLUME CRUISE —	
SALE NAME	<u>AA 03</u>			
PHOTO LINE AND NUMBER	<u>3455-179</u>			
OBJECTIVES	Provide volume for the 86-90 operating period.			
S.A. pg 3				
RESULTS OF MONITORING:				
ROAD LOCATION AND OBJECTIVE	CLOSED ROAD —	OPEN ROAD —	OBJECTIVE / PRESCRIPTION: Con tract vehicle access R <sup>2</sup> 0n <u>Homestead Road &amp; Te Wing G3 &amp; G4 wild</u> <u>Roaring Bull Bench Const in Y2R Ditchland</u>	
FISHERIES / HYDROLOGY	CLASS I CROSSING —	CLASS III CROSSING —		
FMNU II TEMPERATURE	SENSITIVITY: YES — NO —	MAINTAIN 30'		
OBJECTIVE / PRESCRIPTION:	PROTECT CLASS II STREAM CHANNEL. MAINTAIN 30' BUFFER ALONG BOUNDARY WITH STREAM CHANNEL. Direct road away from buffer			
WILDLIFE	IN HABITAT FOR OLD GROWTH SPECIES NO (see attached) OBJECTIVE / PRESCRIPTION:			
VISUAL RECREATION	OBJECTIVE / PRESCRIPTION: SEE ATTACHED Assigned VQO = modification Unit meets assigned VQO			
CULTURAL	KNOWN SITE —	PROBABILITY ZONE: HIGH — MEDIUM —	OBJECTIVE / PRESCRIPTION:	
LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION: H/L land yard. Fell and yard away from stream buffer			
REMARKS: Location: see attached				



SEIS - 90 UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)

WCU: 215 EIS UNIT #: 65 ACRES 38 LOGGING SYSTEM L/L  
 STAND #: \_\_\_\_\_ VOLUME FEET 1231 VOLUME CRUISE \_\_\_\_\_  
 SALE NAME: A A O3  
 PHOTO LINE AND NUMBER: 3483-180

OBJECTIVES Provide volume for the 86-90 operating

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P-CEM 4.1

PLANNED (ORTHO PHOTO)      SCALE: \_\_\_\_\_

**RESULTS OF MONITORING:** ROAD LOCATION — CLOSED ROAD — AND OBJECTIVE  
**ROAD LOCATION** — OPEN ROAD — OBJECTIVE / PRESCRIPTION:  
 No Road in wet S/L line

**SILVICULTURE** OBJECTIVE: Clearcut followed by planting to Sitka spruce—medium reseeding. This is a medium productivity site (Fors 5.I 79). Retain an average of 2 snags per acre for diversity.

54

**RESULTS OF MONITORING:** ROAD LOCATION — CLOSED ROAD — AND OBJECTIVE  
**ROAD LOCATION** — OPEN ROAD — OBJECTIVE / PRESCRIPTION:  
 No Road in wet S/L line

This high-contrast, black-and-white satellite image depicts a complex landscape. A large, dark, irregularly shaped area, possibly representing a forest or a body of water, dominates the upper portion of the frame. This dark region is characterized by intricate, swirling patterns of lighter tones, suggesting a dense canopy or turbulent water. Below this, the terrain transitions into a lighter, more textured area, characterized by a dense, granular pattern of small, bright specks. This texture suggests a mix of open land, perhaps a clearing or a field, and low-lying vegetation. The overall image has a grainy, noisy quality, typical of older satellite imagery or high-contrast processed data. The lighting is stark, creating a strong contrast between the dark and light areas.

SILVICULTURE		OBJECTIVE / PRESCRIPTION: Clearcut followed by planting to sitka spruce - medium reasons. This is a medium productivity site (Farr S.I 79). Retain an average of 2 snags per acre for diversity.	
SOLLS	HIGH HAZARD AREA	OBJECTIVE / PRESCRIPTION:	S.A.
RESULTS OF MONITORING:		ROAD LOCATION	
CLOSED ROAD		OPEN ROAD	
AND OBJECTIVE		OBJECTIVE / PRESCRIPTION:	
		No Road in west S/LY Line	
FISHERIES / HYDROLOGY		CLASS I CROSSING	CLASS II CROSSING
FHMU II		TEMPERATURE SENSITIVITY	YES — NO ↘
OBJECTIVE / PRESCRIPTION:		Protect class II stream channel, maintain 30' buffer on south west boundary with valley bottom channel. Direct cut away from buffer	
WILDLIFE		IN HABITAT FOR OLD GROWTH SPECIES NO (See attached)	
RECREATION		VISUAL OBJECTIVE / PRESCRIPTION: SEE ATTACHED	
		Assisted up to modification and meets assigned up to	
LOGGING SYSTEM		CULTURAL KNOWN SITE PROBABILITY ZONE : HIGH — MEDIUM — OBJECTIVE / PRESCRIPTION:	
		Objective / Prescription: Corroboration yard w/ one end suspension	
REMARKS		In relation: See Attached	

## DUE

## 81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)

VOL 2/5 EIS UNIT b6 ACRES 55 LOGGING SYSTEM HL  
 STAND # 1 VOLUME FEIS 880 VOLUME CRUISE —  
 SALE NAME AA 03  
 PHOTO LINE AND NUMBER 34B -179

OBJECTIVES Provide volume for the 86-90 operating period.

PLANNED (ORTHO PHOTO) SCALE: —

		SILVICULTURE		OBJECTIVE / PRESCRIPTION: <u>Class II crossing</u> to a stand harvested in 1987. This is a medium productivity site (Ave. 5.2 Bf). Consider addition of timber on NE boundary to avoid 150' cutline and blowdown. Retain an average of 2 stags per acre for diversity. Location on photo does not correspond to HJ Deis.
		SOILS	HIGH HAZARD AREA	OBJECTIVE / PRESCRIPTION: <u>PW 9/89</u>
		RESULTS OF MONITORING:		ROAD LOCATION CLOSED ROAD — OPEN ROAD — OBJECTIVE / PRESCRIPTION: <u>Contracted Tree Line after House</u>
		ROAD LOCATION AND OBJECTIVE		Buff Ranch Construction needed to occur. Tie in with
		FISHERIES / HYDROLOGY	CLASS I CROSSING — CLASS II CROSSING —	FMNU II TEMPERATURE SENSITIVITY: YES <u>NO</u>
		OBJECTIVE / PRESCRIPTION: PROTECT CLASS II STREAM CHANNEL / MAINTAIN 50' BUFFER ON ENTIRE BOUNDARY WITH VALLEY BOTTOM CHANNEL. Due to road fall timber away from buffer <u>DK</u> 9/2/89		
		WILDLIFE	IN HABITAT FOR OLD GROWTH SPECIES <u>NO</u> (see attached)	OBJECTIVE / PRESCRIPTION: Logging adjacent to a stand cut in 1987 is not a good time considering habitat diversity.
		VISUAL RECREATION	OBJECTIVE / PRESCRIPTION: <u>See Attached</u> VPO = mobilization Unit meets assigned VPO	KNOWN SITE <u>Probable</u> PROBABILITY ZONE: HIGH — MEDIUM —
		CULTURAL	OBJECTIVE / PRESCRIPTION: <u>—</u>	OBJECTIVE / PRESCRIPTION: <u>—</u>
		LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION: <u>High lead yard. Very small timber</u>	
		REMARKS	<u>Recreation; See Attached 2 — Potential Alpen trail - temp</u>	



Project

## 81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER BI-90 SEIS)

VCU # <u>215</u>	EIS UNIT # <u>67</u>	ACRES <u>90</u>	LOGGING SYSTEM <u>HIL</u>	SILVICULTURE	OBJECTIVE / PRESCRIPTION: Clear cut followed by natural regeneration.
STAND # <u>—</u>	VOLUME FEIS <u>1440</u>	VOLUME CRUISE <u>—</u>			This is a medium productivity site (site under 85% Forest). Retain one acre of 2.5 acres per acre. Stand 116 was cut in 1982 at 8' tall yet. However, a musty & soot separates the two units. Stand 146 lies to the North of Unit 67.
SALE NAME <u>AA 03</u>	PHOTO LINE AND NUMBER <u>33B-157</u>				
<u>OBJECTIVES</u> Provide volume for the 86-90 operating period.		<u>SOILS</u>	<u>HIGH HAZARD AREA</u>	<u>OBJECTIVE / PRESCRIPTION:</u>	No soils concerns ident. recd. Dk 9/89
		<u>RESULTS OF MONITORING:</u>		<u>ROAD LOCATION AND OBJECTIVE</u>	<u>ROAD LOCATION</u> <u>CLOSED ROAD</u> — <u>OPEN ROAD</u> — <u>OBJECTIVE / PRESCRIPTION:</u> Major Rds remain open to General Traffic Logging Spur Black & Blue Harvest
<u>PLANNED (ORTHO PHOTO)</u>		<u>SCALE:</u> <u>—</u>	<u>FISHERIES / HYDROLOGY</u> <u>CLASS I CROSSING</u> — <u>CLASS II CROSSING</u> — <u>CLASS III CROSSING</u> — <u>FMHU II TEMPERATURE SENSITIVITY</u> : YES <u>—</u> NO <u>—</u> <u>OBJECTIVE / PRESCRIPTION:</u> No concerns if harvest prevent boundary mountain 50 buffer + one original fall into unit		
					Dk 9/12/89
				<u>WILDLIFE</u>	<u>IN HABITAT FOR OLD GROWTH SPECIES</u> <u>YES</u> <u>(see attached)</u> <u>OBJECTIVE / PRESCRIPTION:</u> A portion of this unit is to be managed for old growth values. Large unit size considering the amount of past harvest in the area. Wildlife habitat diversity may become limiting. 15 ac. old growth
				<u>VISUAL RECREATION</u>	<u>OBJECTIVE / PRESCRIPTION:</u> SEE ATTACHED <u>ASSISTED VPO = MAX MODIFICATION</u> <u>(Unit meets assigned VPO)</u>
				<u>CULTURAL</u>	<u>KNOWN SITE</u> <u>—</u> <u>PROBABILITY ZONE</u> : <u>HIGH</u> <u>—</u> <u>MEDIUM</u> <u>—</u> <u>OBJECTIVE / PRESCRIPTION:</u>
				<u>LOGGING SYSTEM</u>	<u>OBJECTIVE / PRESCRIPTION:</u> Hill lead yard. Small timber may make adequate on slopes difficult to find. Tell + yard away from stream buffer
				<u>REMARKS</u>	Recreation: See Attached



Sale Name Freshwater Ck.

DESCRIPTION OF UNIT LAYOUT

VCU 215

Designed by \_\_\_\_\_ Date \_\_\_\_\_

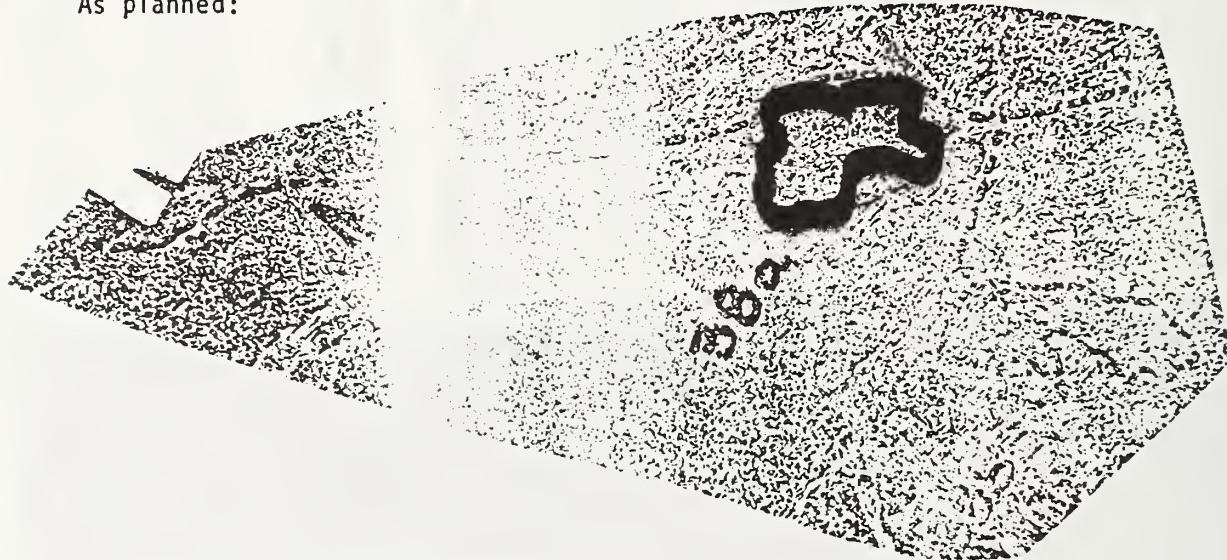
Laid out by \_\_\_\_\_ Date \_\_\_\_\_

Photo Number 32B-12 Unit Diagrams Unit Number 30 149  
PEIS vol. 2  
636

Show: System roads; temporary roads; cutting lines; junction stations; landings; percent slope from cutting line to landing for downhill yarding; uphill yarding; splitlines; streams to be protected; areas requiring specific yarding instructions (partial or full suspension, etc.); true north orientation; tie in of traverse lines, skyline profile and numbers.

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As planned:



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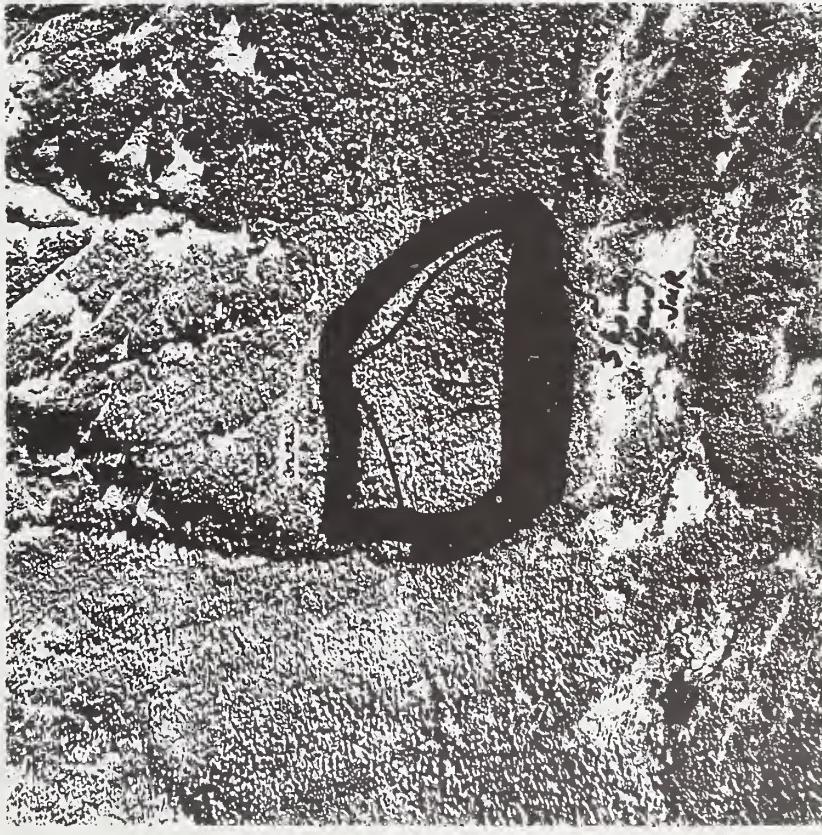
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VQU 215 EIS UNIT 18D ACRES 75 LOGGING SYSTEM H/L  
 STAND # 4A 03 VOLUME FEIS 1592 VOLUME CRUISE \_\_\_\_\_  
 SALE NAME  PHOTO LINE AND NUMBER 53A - 160

OBJECTIVES Provide volume for the 86-90 operating period.

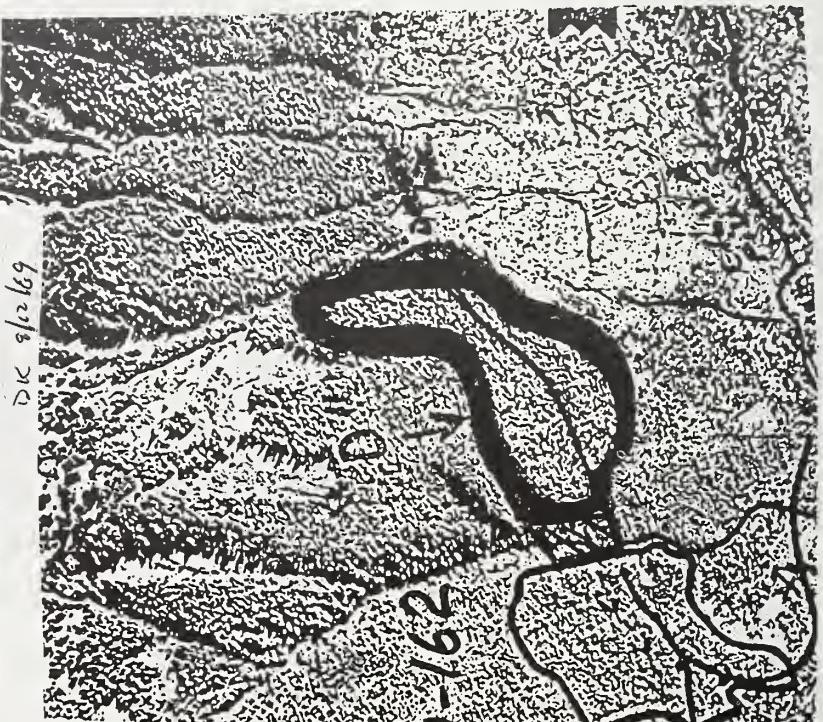
<u>PLANNED (ORTHO PHOTO)</u>		<u>SCALE:</u> _____	<u>RESULTS OF MONITORING:</u> ROAD LOCATION AND OBJECTIVE <b>Block to Public Office after House</b>	<u>OBJECTIVE / PRESCRIPTION:</u> Clear out hazard by natural and artificial regeneration. Site productivity ranges from 85'00 with an average of 85' (Faro). Southeast portion of unit may be suitable for shrub clearing. Yards should start 10' to 15' feet apart as possible in this area to minimize regeneration problems. Plant this area to site species. Retain an acreage of 2 successional acres.
<u>SOILS</u>		<u>HIGH HAZARD AREA</u>	<u>OBJECTIVE / PRESCRIPTION:</u> <b>No Soils concerns identified.</b>	<u>OBJECTIVE / PRESCRIPTION:</u> <b>Clear 9/83</b>
<u>FISHERIES / HYDROLOGY</u>		<u>ROAD LOCATION AND OBJECTIVE</u>	<u>CLASS I CROSSING</u> <input checked="" type="checkbox"/> <u>CLASS II CROSSING</u> <input type="checkbox"/> <u>CLASS III CROSSING</u> <input type="checkbox"/> FARO <u>1</u> TEMPERATURE SENSITIVITY: YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> <u>OBJECTIVE / PRESCRIPTION:</u> Prevent class 2 stream channel / mainline 100' buffer to stream channel along south boundary line. Ditch mid fall away from buffer	<u>OBJECTIVE / PRESCRIPTION:</u> <b>DK 9/12/85.</b>
<u>WILDLIFE</u>		<u>IN HABITAT FOR OLD GROWTH SPECIES</u> <input type="checkbox"/> <u>NO</u> (see attached) <u>OBJECTIVE / PRESCRIPTION:</u>	<u>CLASS I CROSSING</u> <input type="checkbox"/> <u>CLASS II CROSSING</u> <input type="checkbox"/> <u>CLASS III CROSSING</u> <input type="checkbox"/> FARO <u>1</u> TEMPERATURE SENSITIVITY: YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> <u>OBJECTIVE / PRESCRIPTION:</u> Prevent class 2 stream channel / mainline 100' buffer to stream channel along south boundary line. Ditch mid fall away from buffer	<u>OBJECTIVE / PRESCRIPTION:</u> <b>Wildlife habitat diversity is a concern in this drainage.</b>
<u>VISUAL CREATION</u>		<u>KNOWN SITE</u> <input type="checkbox"/> <u>PROBABILITY ZONE:</u> HIGH <input type="checkbox"/> MEDIUM <input checked="" type="checkbox"/> <u>OBJECTIVE / PRESCRIPTION:</u> SEE ATTACHED <b>Unit meets assigned VPO of Mod.</b>	<u>OBJECTIVE / PRESCRIPTION:</u> <b>SEE ATTACHED</b>	<u>OBJECTIVE / PRESCRIPTION:</u> <b>DK</b>
<u>CULTURAL LOGGING SYSTEM</u>		<u>LOGGING SYSTEM</u>	<u>OBJECTIVE / PRESCRIPTION:</u> <b>1/1 end yard. Fall and yard away from stream buffer</b>	<u>REMARKS</u> <input type="checkbox"/> <b>Recreation: See attached</b>



SEIS 3

86-90 UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 86-90 FEIS)

VCU <u>217</u>	EIS UNIT # <u>3</u>	ACRES <u>.56</u>	LOGGING SYSTEM <u>H-L</u>	SILVICULTURE OBJECTIVE / PRESCRIPTION: THIS UNIT IS ADJACENT TO UNITS 49 & 162. UNIT 49 WAS MARVESTED BETWEEN 1962-64 & HAD A PT IN 1980 & 81. UNIT 162 WAS HARVESTED IN 1981 & HAS CERTIFIABLE AS BEING STOCKED IN 1984. THERE IS A GOOD SEEDLING ABOVE UNIT 3. ALLOW FOR NATURAL REGENERATION FOLLOWING HARVESTING. LEAVES AT LEAST 1/3 SAVINGS ARE 35x10'-10', 52x20'-10'. ADDITION, IT HAS BEEN DETERMINED THAT THIS UNIT
STAND # <u>VOLUME FEIS</u>	<u>1129</u>	VOLUME CRUISE <u>A P.C. &amp; D.</u>		
SALE NAME <u>APC # 90</u>				
PHOTO LINE AND NUMBER <u>343 376 186</u>				
01 FISHERIES / HYDROLOGY				
PROJECT CLASS I STREAM CHANNEL ALONG SOUTH LINE / MAINTAIN 10' BUFFER TO CHANNEL.				
PROJECT SMALL CLASS I STREAM CHANNEL ALONG NORTH LINE, DEFER SECTION OR MAINTAIN 50' BUFFER TO SMALL CHANNEL.				
SCALE: <u>1:15240</u>	ROAD LOCATION AND OBJECTIVE	CLOSED ROAD — OPEN ROAD — RESULTS OF MONITORING:	OBJECTIVE / PRESCRIPTION: <i>OK</i>	OBJECTIVE / PRESCRIPTION: <i>Block off House to wild life traffic</i>
FISHERIES / HYDROLOGY	CLASS I CROSSING <input checked="" type="checkbox"/> CLASS II CROSSING <input type="checkbox"/> CLASS III CROSSING <input type="checkbox"/> FHMU <input checked="" type="checkbox"/> TEMPERATURE SENSITIVITY: YES <input type="checkbox"/> NO <input type="checkbox"/> OBJECTIVE / PRESCRIPTION: buffers borders along channels. Hydrc & Fluv Review needed.			
WILDLIFE	IN HABITAT FOR OLD GROWTH SPECIES YES (see attached) range is 10 acres or less. No identified in project area. However, 15.1K Deer winter range. Small Fig. on slope of hill. Bear Wildlife. Bird Survey done check. 56 ac. Deer			
RECREATION	VISUAL OBJECTIVE / PRESCRIPTION: See Attached Unit map: An area VPC at Head of stream.			
CULTURAL	KNOWN SITE — PROBABILITY ZONE: HIGH — MEDIUM — OBJECTIVE / PRESCRIPTION:			
LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION: <u>fall land yard</u> . Fall and yard any from V notes.			
REMARKS	Recreation: See Attached			



# 81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)

VCU 217	EIS UNIT # 42	ACRES 73	LOGGING SYSTEM HL	SILVICULTURE	OBJECTIVE / PRESCRIPTION: Create cut & harvest pattern with natural regeneration. This unit is in a high productivity area site under 95-100 (Fm). Average Site Index is 97 (Fm). Monitor regeneration and regeneration. thin at age '12-16 yrs. with a wildlife emphasis. Retain an ave. of 2 snags per acre for diversity.
STAND #	VOLUME FEIS	245	VOLUME CRUISE		
SALE NAME	A A O3				
PHOTO LINE AND NUMBER	368 - 353				
OBJECTIVES	Provide volume for fl. 86-90 operating		SOILS	HIGH HAZARD AREA	OBJECTIVE / PRESCRIPTION:

P. M. d.

## SiLViCULTURE: (CONT.). LIES IN CRITICAL DEER WINTER

RANGE - (See 5-29-87 LETTER TO FOREST SERVICE) OS25871045 Tn 20 R30 Hw 1  
SHOULD THIS UNIT BE HARVESTED & SUCCESSFULLY REGENERATED,  
SCHEDULE A PCT w/ BOTH WILDLIFE & TIMBER OBJECTIVES  
@ 12-18 YEARS.

JPT 9-9-89

## RESULTS OF MONITORING:

ROAD LOCATION	CLOSED ROAD — OPEN ROAD —	OBJECTIVE / PRESCRIPTION
AND OBJECTIVE	Controlled vehicle access after harvest	

## No Cank, Caninus



FISHERIES / HYDROLOGY	CLASS I CROSSING — CLASS II CROSSING — CLASS III CROSSING —
FMNU	TEMPERATURE SENSITIVITY: YES — NO —
OBJECTIVE / PRESCRIPTION: NO CONCERN, IF MAINTAIN BOUNDARY ABOVE V-NB-2047, SIDE SPACES ON SOUTH SIDE OF UNIT, MAINTAIN PRESENT WEST SIDE BOUNDARY, DC 9/2/89.	
WILDLIFE	IN HABITAT FOR OLD GROWTH SPECIES Yes (See attached)
RECREATION	OBJECTIVE / PRESCRIPTION: The western 1/2 of this 3 ac. old Unit is located in deer winter range. Unit provides a good buffer on estuary habitat to the north. Best unit size in old growth & Deer winter range habitat is 10 acres or less.
VISUAL	OBJECTIVE / PRESCRIPTION: SITE ATTACHED
LOGGING SYSTEM	Unit needs assigned VQO of Max. Mod

CULTURAL	KNOWN SITE — PROBABILITY ZONE: HIGH — MEDIUM —
LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION: H/L land work. Fall and yard away from Stream,

REMANENT	Recreation: See attached
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ADDITIONAL INFO → MODERATE TO HEAVY MISTLETOE THROUGHOUT THE UNIT. WHT/YC/VACC./SKUNK CABBAGE ⇒ FROM TSE & PRESCRIPTION NOTES.  
- UNIT IS LAST REMAINING CRITICAL DEER WINTER RANGE ON THE NORTH SIDE OF THE KENNEL CREEK VALLEY. ⇒ WILDLIFE REPORT.

**81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)**

VCU <u>217</u>	EIS UNIT # <u>56</u>	ACRES <u>60</u>	LOGGING SYSTEM <u>LL</u>	SILVICULTURE OBJECTIVE / PRESCRIPTION: Clearcut harvest followed by natural regeneration. This is a slight to moderate site with an average site index of 85' (Farr). Inclusions of non-forest within unit. Suggest adding acreage on south boundary of unit. Retain acreage of 25mags per acre for diversity.
STAND # <u> </u>	VOLUME FEIS <u>1944</u>	VOLUME CRUISE <u> </u>	SOILS HIGH HAZARD AREA <u> </u>	OBJECTIVE / PRESCRIPTION: unit okay as layout out. Recovered to full successional stage to reduce damage to soil / re-structure.
SALE NAME <u>PA 03</u>	PHOTO LINE AND NUMBER <u>34B - 186</u>	RESULTS OF MONITORING: ROAD LOCATION AND OBJECTIVE CLOSED ROAD — OPEN ROAD — OBJECTIVE / PRESCRIPTION: Control vehicle traffic after harvest	WILDLIFE IN HABITAT FOR OLD GROWTH SPECIES <u>NO</u> (See attached) OBJECTIVE / PRESCRIPTION: Protect non-forest inclusions within the unit for habitat diversity.	
OBJECTIVES Provide volume for the 86-90 operating period.		FISHERIES / HYDROLOGY FHMU II TEMPERATURE SENSITIVITY: YES — NO <input checked="" type="checkbox"/>	CLASS I CROSSING <u> </u> — CLASS II CROSSING <u> </u> — CLASS III CROSSING <u> </u> — OBJECTIVE / PRESCRIPTION: Protect class II stream channel vulnerability / maintain 50' buffer along sensitive roadside and within valley bottom channel. Directionally fell timber away from buffer. 7/12/69.	VISUAL RECREATION ASSISTED VEG MORTIFICATION Unit needs assigned VPs
PLANNED (ORTHO PHOTO)		SCALE: <u> </u>	CULTURAL KNOWN SITE <u> </u> — PROBABILITY ZONE: HIGH — MEDIUM — OBJECTIVE / PRESCRIPTION:	LOGGING SYSTEM OBJECTIVE / PRESCRIPTION: Grabline 1 yard with one end suspended to meet mitigate soft concerns.
Recreation: See Attached				

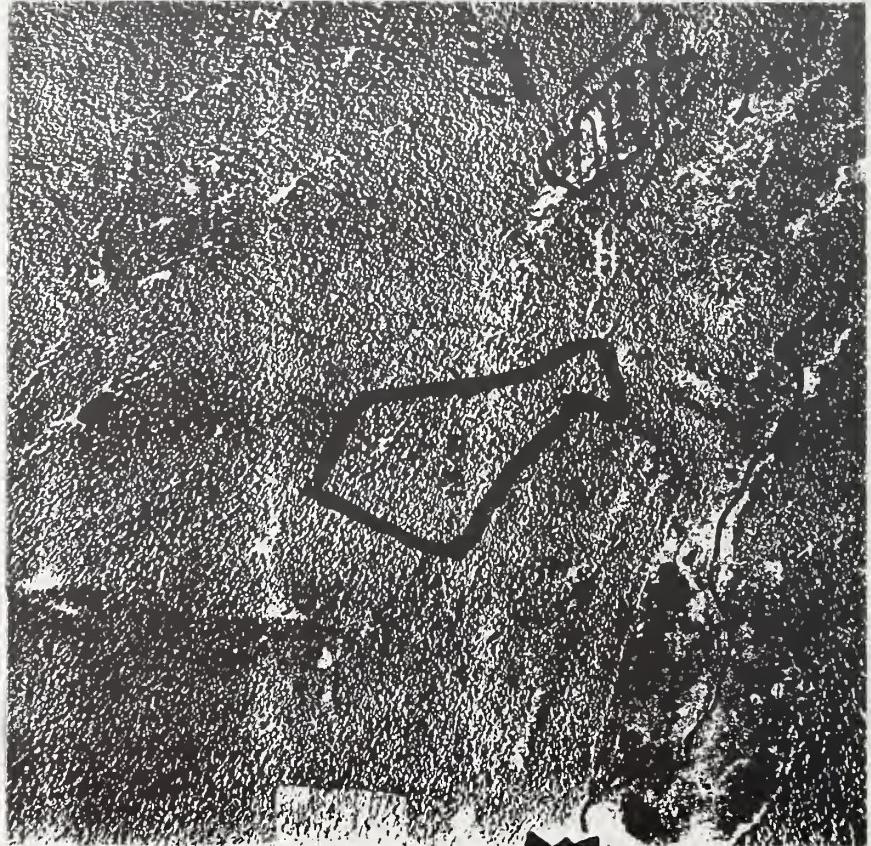




*Not  
S.Tell*

## 81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)

EIS UNIT # <u>218</u>	ACRES <u>.21</u>	LOGGING SYSTEM <u>H/L</u>	SILVICULTURE OBJECTIVE / PRESCRIPTION: Clearcut harvest with natural regeneration. Average site value is 45 board feet ranging from 80 to 100. This unit is adjacent to two stands previously harvested in 1977 and '78. Stand '600' to the east was cut in 1977 planted in '82 and certified as regrown in '89. Stand '1800' (to the northwest) was planted in 1982 and has not been certified - Regrowth is just 5' tall. This is a moderate to high site ranging from 80-100 with an average of 85 (Farr). Retain an average of 25% snag per acre for diversity.
STAND # <u>1</u>	VOLUME FEIS <u>/303</u>	VOLUME CRUISE <u>03</u>	SOILS HIGH HAZARD AREA <u>      </u>
SALE NAME <u>A12</u>	PHOTO LINE AND NUMBER	OBJECTIVE / PRESCRIPTION: <i>with slope as logged out PW 9/89</i>	
RESULTS OF MONITORING:			
ROAD LOCATION AND OBJECTIVE <u>No Cuts done</u>	CLOSED ROAD <input checked="" type="checkbox"/>	OPEN ROAD <input type="checkbox"/>	OBJECTIVE / PRESCRIPTION:
FISHERIES / HYDROLOGY FHMU <input type="checkbox"/> TEMPERATURE SENSITIVITY: YES <input type="checkbox"/> NO <input type="checkbox"/>			
OBJECTIVE / PRESCRIPTION:			
WILDLIFE IN HABITAT FOR OLD GROWTH SPECIES <u>NO</u> (see attached)	N/A CONCEALED INVENTORY, AND SURVEY <u>8/89</u> OBJECTIVE / PRESCRIPTION:		
VISUAL RECREATION ASSIGNERS <u>V90= max wood.</u>	OBJECTIVE / PRESCRIPTION: SEE ATTACHED Unit meets assigned V90		
CULTURAL KNOWN SITE <input type="checkbox"/>	PROBABILITY ZONE: HIGH <input type="checkbox"/> MEDIUM <input type="checkbox"/> OBJECTIVE / PRESCRIPTION:		
LOGGING SYSTEM CONCERN IDENTIFIED	OBJECTIVE / PRESCRIPTION: Hit lead yard, no specific concerns identified.		
REMARKS Remarks: See attached Potential recreation cabin, campground & trail at head of take.			



**81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)**

NOTES:  
Tall.

VCU <u>2/8</u>	EIS UNIT # <u>22</u>	ACRES <u>18</u>	LOGGING SYSTEM <u>H2</u>	SILVICULTURE OBJECTIVE / PRESCRIPTION: Clearcut harvest followed with natural regeneration. Ave. 5.4 in dbh '96 (high productivity). Stand adjacent to stand 1600, 1700, & 1801 which were cut in 1977 and 1978. Std 1600 and 1700 were planted in 1982 and certified as regenerated in 1989. Stand 1801 has not been certified as regenerated. This unit is a leeward strip montane regeneration and has commercial timber at a geo 12-18 yrs, with timber emphasis. Retain an average of 2 snags per acre for diversity. Required not 5' tall in adjacent cutline.
STAND # <u>4</u>	VOLUME FEIS <u>479</u>	VOLUME CRUISE <u>03</u>		OBJECTIVE / PRESCRIPTION:
SALE NAME <u>AA</u>	PHOTO LINE AND NUMBER			
<b>OBJECTIVES</b> Provide volume for the 86-90 operations period.				
PLANNED (ORTHO PHOTO) 				PLANNED (ORTHO PHOTO) SCALE: _____
				RESULTS OF MONITORING: ROAD LOCATION AND OBJECTIVE <u>CLOSED ROAD — OPEN ROAD — NO CONCERN A (Want to Given Closed)</u>
				OBJECTIVE / PRESCRIPTION: FISHERIES / HYDROLOGY <u>CLASS I CROSSING — FHMU —</u> TEMPERATURE SENSITIVITY: YES <u>NO</u> — OBJECTIVE / PRESCRIPTION:
				<u>No Concern IDENTIFIED.</u> <u>5000 9/29</u> (See attached)
				WILDLIFE IN HABITAT FOR OLD GROWTH SPECIES <u>NO</u> (See attached)
				VISUAL RECREATION OBJECTIVE / PRESCRIPTION: <u>SEE ATTACHED</u> Assisted Vgo = max vgo. <u>Unit meets assigned Vgo</u>
				CULTURAL KNOWN SITE <u>          </u> PROBABILITY ZONE : HIGH <u>  </u> MEDIUM <u>  </u> OBJECTIVE / PRESCRIPTION:
				LOGGING SYSTEM <u>          </u> OBJECTIVE / PRESCRIPTION: <u>Log blossom, yard, w/ one end suspension,</u>
				REMARKS <u>Recreation; See Attached</u> <u>Potential Recreation cabin, campground + trail at Paul of Tahl.</u>

## 81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)

VUL	EIS UNIT #	<u>23</u>	ACRES	<u>38</u>	LOGGING SYSTEM	<u>H2</u>	SILVICULTURE	OBJECTIVE / PRESCRIPTION: Clearcut harvest followed with natural regeneration. This is a medium to high productivity site with an average (Fair) SSI index of 95%. Moderate regeneration and at age 12-18 yrs. recommended than with a timber emphasis. Retain an average of 2 snags per acre for diversity.
STAND #	VOLUME FEIS	<u>1011</u>	VOLUME CRUISE	—				
SALE NAME	<u>A4 O3</u>							
PHOTO LINE AND NUMBER	<u>36 B -116</u>							
OBJECTIVES	Provide volume for the 86-90 operating period.					SOILS	HIGH HAZARD AREA	OBJECTIVE / PRESCRIPTION:
							<u>S, A,</u>	
RESULTS OF MONITORING:								
ROAD LOCATION AND OBJECTIVE	CLOSED ROAD	OPEN ROAD	—	OBJECTIVE / PRESCRIPTION:				
Control Access Allows to Grow Closed								
Extend Existing R & toward								
FISHERIES / HYDROLOGY	CLASS I CROSSING	CLASS II CROSSING	CLASS III CROSSING	/				
FHMU <u>III</u> TEMPERATURE SENSITIVITY: YES — NO —								
OBJECTIVE / PRESCRIPTION: Maintain water quality IN CLASS <u>III</u> STREAM CHANNEL. LOCATE UNIT BOUNDARY ABOVE V-WOTR & SINCE BOUNDARY <u>SRP / 9-89</u>								
A/ CHANNEL TYPE						WILDLIFE	IN HABITAT FOR OLD GROWTH SPECIES	NO (See attached)
OBJECTIVE / PRESCRIPTION:								
VISUAL RECREATION	OBJECTIVE / PRESCRIPTION: SEE ATTACHED							
Assumed VPO = MAX mod								
Unit must assigned VPO								
CULTURAL	KNOWN SITE	PROBABILITY ZONE	HIGH	—	MEDIUM	—	OBJECTIVE / PRESCRIPTION:	
LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION: Grabinski; yard to minimize soil disturbance, fell and yard away from class <u>III</u> stream,							
REMARKS Recreational: See attached								
Potential reexamination within, camp ground								
at paved trail.								



UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81 - 90 SEIS)

VCL	<u>218</u>	EIS UNIT *	<u>24</u>	ACRES	<u>88</u>	LOGGING SYSTEM	<u>SL</u>	SILVICULTURE	OBJECTIVE / PRESCRIPTION: Clearcut harvest with natural regeneration. This a medium and high productivity site. The average site index is 93 (Farn). Recommended thin at a rate of 12'-18' yrs. with timber emphasis. Retain an ave. of 25%age per acre for diversity.
STAND *		VOLUME FEIS	<u>2341</u>	VOLUME CRUISE					
SALE NAME	<u>AH 03</u>	PHOTO LINE AND NUMBER							
OBJECTIVES	Provide volume for the 86-90 operating period.								
PLANNED (ORTHO PHOTO)	SCALE :								
RESULTS OF MONITORING: ROAD LOCATION AND OBJECTIVE	CLOSED ROAD	OPEN ROAD	OBJECTIVE / PRESCRIPTION: Controlled journaling access Road Network						
Steep grade is 15 + needs to access this unit									
FISHERIES / HYDROLOGY	CLASS I CROSSING	CLASS II CROSSING	CLASS III CROSSING —						
	FHMU	TEMPERATURE SENSITIVITY:	YES	NO					
OBJECTIVE / PRESCRIPTION:									
WILDLIFE	IN HABITAT FOR OLD GROWTH SPECIES	NO (see attached)							
OBJECTIVE / PRESCRIPTION:									
VISUAL RECREATION	OBJECTIVE / PRESCRIPTION: SEE ATTACHED								
Professional VPO = modification Unit meets assigned VPO									
CULTURAL	KNOWN SITE	PROBABILITY ZONE : HIGH — MEDIUM —							
LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION: Slackline full suspension on lower portion of unit.								
REMARKS	Observation: See Attached								

**81 - 90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)**

VCU <u>218</u>	EIS UNIT # <u>25</u>	ACRES <u>44</u>	LOGGING SYSTEM <u>H</u>	SILVICULTURE Site with one site under regeneration. This is a low to medium intensity regeneration. Unit is adjacent to stand 130 which was cut in 1978. It was certified as regeneration in 1979 based on a stocking survey conducted in 1982 that shows 115 trees per acre distributed. Retain an average of 2 snags per acre for diversity. Define non-select cut lines.	OBJECTIVE / PRESCRIPTION: Unit. Possible addition across unit or south side of unit.
STAND # <u> </u>	VOLUME FEIS <u>1170</u>	VOLUME CRUISE <u> </u>	SALE NAME <u>AH 03</u>	SOILS HIGH HAZARD AREA <u> </u>	OBJECTIVE / PRESCRIPTION: No soils concerns idc. t. fixed
PHOTO LINE AND NUMBER <u> </u>	OBJECTIVES Provide volume for the 86-90 operating period.				RESULTS OF MONITORING: 8/11 1/89
PLANNED (ORTHO PHOTO)	SCALE: <u> </u>	ROAD LOCATION AND OBJECTIVE <i>August Road &amp; Clinch Branch Unit at 120 ft</i>	CLOSED ROAD — OPEN ROAD — Corded vehicle access	CLASS II CROSSING — FHMU — TEMPERATURE SENSITIVITY: YES — NO —	OBJECTIVE / PRESCRIPTION: No concerns identified.
WILDLIFE	IN HABITAT FOR OLD GROWTH SPECIES <u>NO</u> (See attached)	WILDLIFE OBJECTIVE / PRESCRIPTION:			
VISUAL RECREATION	OBJECTIVE / PRESCRIPTION: <i>Site Attractions Assisted VPO</i>	CLASS III CROSSING — FHMU — TEMPERATURE SENSITIVITY: YES — NO —			OBJECTIVE / PRESCRIPTION: No concerns identified.
CULTURAL	KNOWN SITE <u> </u>	PROBABILITY ZONE: HIGH — MEDIUM —			OBJECTIVE / PRESCRIPTION: Concern w/ silviculture on unit modifications.
LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION: <i>Hilcad Yard</i>				REMARKS <u>Recreation: see attached</u>



81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)

<p style="text-align: center;">SILVICULTURE OBJECTIVE / PRESCRIPTION: Observe harvest, measure linear growth class yellow cedar regeneration. This is a low site (Fens).</p>							
VCU <u>218</u>	EIS UNIT # <u>28</u>	ACRES <u>37</u>	LOGGING SYSTEM <u>HL</u>	SILVICULTURE KNOWN SITE —	OBJECTIVE / PRESCRIPTION:		
STAND #	VOLUME FEIS	<u>592</u>	VOLUME CRUISE	FHMU —	CLASS III CROSSING —		
SALE NAME <u>A A 03</u>	TEMPERATURE SENSITIVITY: YES — NO —						
<p><b>OBJECTIVES</b> Provide volume for the 86-90 operations Provide</p>				OBJECTIVE / PRESCRIPTION:			
<p>PHOTO LINE AND NUMBER</p>				ROAD LOCATION AND OBJECTIVE	CLOSED ROAD — OPEN ROAD —	OBJECTIVE / PRESCRIPTION:	
<p>PLANNED (ORTHO PHOTO)</p>				SOILS	HIGH HAZARD AREA —	OBJECTIVE / PRESCRIPTION:	
<p>RESULTS OF MONITORING:</p>				<p>NO SOILS CONCERNED older fl. lead NO CONCERN'S <u>Scandina</u> <u>Scandina</u></p>			
<p>RESULTS OF MONITORING:</p>				FISHERIES / HYDROLOGY	CLASS I CROSSING —	CLASS II CROSSING —	CLASS III CROSSING —
<p>RESULTS OF MONITORING:</p>				FHMU —	TEMPERATURE	SENSITIVITY: YES —	NO —
<p>RESULTS OF MONITORING:</p>				OBJECTIVE / PRESCRIPTION:			
<p>RESULTS OF MONITORING:</p>				NO CONCERN'S IDENTIFIED.			
<p>RESULTS OF MONITORING:</p>				WILDLIFE	IN HABITAT FOR <u>old growth</u> SPECIES <u>NO</u> (see attached)	OBJECTIVE / PRESCRIPTION:	
<p>RESULTS OF MONITORING:</p>				VISUAL RECREATION	OBJECTIVE / PRESCRIPTION: <u>see attached</u> Unit meets design w/o of max. mod.		
<p>RESULTS OF MONITORING:</p>				CULTURAL	KNOWN SITE —	PROBABILITY ZONE : HIGH — MEDIUM —	OBJECTIVE / PRESCRIPTION :
<p>RESULTS OF MONITORING:</p>				LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION: H. lead yard.		
<p>RESULTS OF MONITORING:</p>				REMARKS	<u>Recreation; see attached</u>		
							

## 81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)

VCU <u>2/8</u>	EIS UNIT # <u>29</u>	ACRES <u>57</u>	LOGGING SYSTEM <u>HL</u>	SILVICULTURE Substitute timber taking leave strip cutting 2 previously harvested areas (Stand 1400 and 1500). These areas were cut in 1981 and 79 at approximately 1/2 of their natural growth rate. They were replanted in 1983. This is a high site stand in a low elevation area. There are no significant lowland areas in the unit.	OBJECTIVE / PRESCRIPTION: Clear cut areas to be harvested by natural regeneration. Stand 1/2 of unit is non-CFL All index 25 (Final).
STAND #	VOLUME FEIS	<u>944</u>	VOLUME CRUISE		
SALE NAME					
PHOTO LINE AND NUMBER					
OBJECTIVES					
				RESULTS OF MONITORING:	
ROAD LOCATION AND OBJECTIVE		CLOSED ROAD —	OPEN ROAD —	OBJECTIVE / PRESCRIPTION: <u>No concern</u>	
FISHERIES / HYDROLOGY	CLASS I CROSSING —	CLASS II CROSSING —	CLASS III CROSSING —		
OBJECTIVE / PRESCRIPTION <u>OK 5/9/89 at zone 0</u>				FHMU — TEMPERATURE SENSITIVITY: YES <u>NO</u> NO	
WILDLIFE	IN HABITAT FOR <del>BED</del> GROWTH SPECIES <u>NO</u> (see attached)			OBJECTIVE / PRESCRIPTION:	
VISUAL RECREATION	OBJECTIVE / PRESCRIPTION <u>See attachment</u>				
CULTURAL	Unit located in and meets assigned VQO of Max. Modification			KNOWN SITE — PROBABILITY ZONE: HIGH — MEDIUM — LOW —	
LOGGING SYSTEM	unit modification, hill end yard, fall line			OBJECTIVE / PRESCRIPTION: Corridor with suggested yard away from stream.	
REMARKS <u>Recreation: See attachment</u>					



81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS.)

VOG 218	EIS UNIT # 31	ACRES 49	LOGGING SYSTEM HL	SILVICULTURE	OBJECTIVE / PRESCRIPTION: Clearcut followed with natural regeneration. This is a moderately productive site area, site under 80' (Fm). Retain area of 2 swags per acre for diversity.						
STAND #	VOLUME FEIS 1303	VOLUME CRUISE									
SALE NAME											
PHOTO LINE AND NUMBER											
<u>OBJECTIVES</u>	Provide volume for the 86-90 operating period.										
<table border="1"> <tr> <td>ROAD LOCATION</td> <td>CLOSED ROAD — OPEN ROAD —</td> <td>OBJECTIVE / PRESCRIPTION:</td> </tr> <tr> <td>AND OBJECTIVE</td> <td>Control vehicle access after Howard</td> <td></td> </tr> </table>						ROAD LOCATION	CLOSED ROAD — OPEN ROAD —	OBJECTIVE / PRESCRIPTION:	AND OBJECTIVE	Control vehicle access after Howard	
ROAD LOCATION	CLOSED ROAD — OPEN ROAD —	OBJECTIVE / PRESCRIPTION:									
AND OBJECTIVE	Control vehicle access after Howard										
<table border="1"> <tr> <td>RESULTS OF MONITORING:</td> <td></td> <td></td> </tr> <tr> <td>PLANNED (ORTHO PHOTO)</td> <td>SCALE:</td> <td></td> </tr> </table>						RESULTS OF MONITORING:			PLANNED (ORTHO PHOTO)	SCALE:	
RESULTS OF MONITORING:											
PLANNED (ORTHO PHOTO)	SCALE:										
FISHERIES / HYDROLOGY	CLASS I CROSSING — CLASS II CROSSING — CLASS III CROSSING —	TEMPERATURE SENSITIVITY: YES — NO —									
OBJECTIVE / PRESCRIPTION: Maintain water quality in CLASS II stream. Split yard directionally fall along CLASS III V-notch slopes. Don't log 26' V-notch side slopes.											
A1 channel / type	SVR 2/89	IN HABITAT FOR OLD GROWTH SPECIES NO (See attached)									
WILDLIFE	OBJECTIVE / PRESCRIPTION:										
VISUAL RECREATION	OBJECTIVE / PRESCRIPTION: SEE ATTACHED	ASSIGNED VQO									
CULTURAL	KNOWN SITE	PROBABILITY ZONE: HIGH — MEDIUM —									
LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION: Hilled yard fell and yard away from stream buffer + V notches split setting and yard either side of Class III stream.										
REMARKS	Recreation: See attached										



## 81 - 90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81 - 90 SEIS)

VCU	218	EIS UNIT	*333	ACRES	69	LOGGING SYSTEM	HL								
STAND #	<u>4</u>	VOLUME FEIS	<u>194/6</u>	VOLUME CRUISE	<u>—</u>										
SALE NAME	<u>1A1A 03</u>														
PHOTO LINE AND NUMBER	<u>—</u>														
OBJECTIVES	<i>Objectives</i>														
RESULTS OF MONITORING:															
ROAD LOCATION AND OBJECTIVE		CLOSED ROAD		OPEN ROAD		OBJECTIVE / PRESCRIPTION:									
Block Span Rd into unit															
FISHERIES / HYDROLOGY	CLASS I CROSSING		CLASS II CROSSING		CLASS III CROSSING										
FHMLA/B		TEMPERATURE SENSITIVITY:		YES		NO									
OBJECTIVE / PRESCRIPTION:	FISH & HYDRO FIELD REVIEW NEEDED.														
WILDLIFE		<i>Emphasis</i> IN HABITAT FOR <del>ENTH</del> SPECIES NO (see attached) OBJECTIVE / PRESCRIPTION: Adjacent clearcut stands should be 5 ft. tall or better to provide escape cover for wildlife.													
VISUAL RECREATION	OBJECTIVE / PRESCRIPTION:														
unit located in 3, meets assigned VPO if Max. Modification															
CULTURAL	KNOWN SITE		PROBABILITY ZONE :		HIGH — MEDIUM — LOW										
LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION Hill end yard. Fell an d yard away from buffer.														
REMARKS	Recreation: See Attached														
															

**81-90 SEIS UNIT LAYOUT MITIGATION AND EFFECTIVENESS**

<b>RESOURCE GROUP</b>	<b>MITIGATION MEASURE</b>	<b>ANTICIPATED EFFECTIVENESS</b>
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- ① Split yard Class II channel above  
the road.  
② maintain 50 ft streamside buffer on  
Class I stream below the road.  
③ Specialist should assist with layout.  
④ use 100' buffer on Class I stream segments  
⑤ Directly lay fuel timeline away from buffers

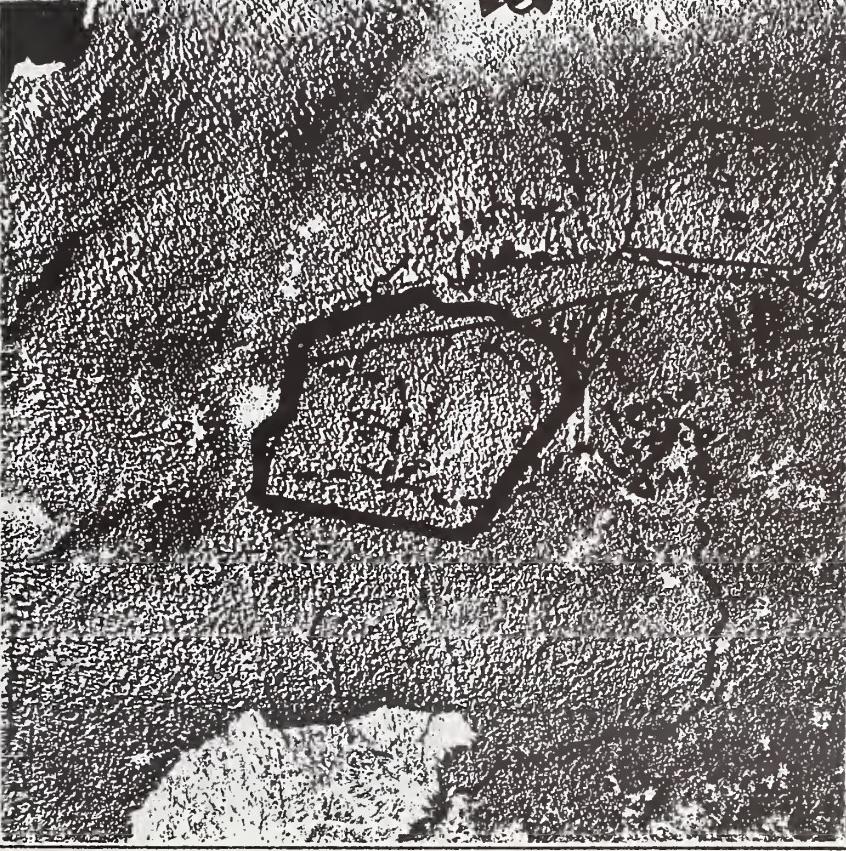
**FISHERIES/HYDROLOGY**

**81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)**

VCU <u>218</u>	EIS UNIT <u>* 34</u>	ACRES <u>.84</u>	LOGGING SYSTEM <u>HLC</u>	SILVICULTURE / PRESCRIPTION: Clear cut harvest with natural regeneration. This is a medium productive site (Fan Site Index 50). This unit is adjacent to a previously harvested unit cut in 1978 (Stand 250). Stand 250 was planted in 1982. Unit is not stable. Retain an average of 2 snags per acre for direct defen area along the creek as shown on plan for safety problems and muskeg. Substitute timber on east boundary.
STAND # <u>—</u>	VOLUME FEIS <u>1344</u>	VOLUME CRUISE <u>—</u>	SALE NAME <u>A A O3</u>	OBJECTIVE / PRESCRIPTION: Objective / Prescription: Substitution timber on east boundary.
PHOTO LINE AND NUMBER	36 B3 - 113			SOILS / HIGH HAZARD AREA / OBJECTIVE / PRESCRIPTION: Objective / Prescription: Substitution timber on east boundary.
OBJECTIVES	Provide volume for the 86-90 operating period.			S.A.
RESULTS OF MONITORING:				ROAD LOCATION / OBJECTIVE / PRESCRIPTION: CLOSED ROAD — OPEN ROAD — OBJECTIVE / PRESCRIPTION: <u>Control traffic allowing grassland</u>
PLANNED (ORTHO PHOTO)	SCALE: <u>—</u>	FISHERIES / HYDROLOGY /	CLASS I CROSSING / CLASS II CROSSING / CLASS III CROSSING /	ROAD LOCATION / OBJECTIVE / PRESCRIPTION: <u>FMNU III TEMPERATURE SENSITIVITY: YES NO X</u>
				OBJECTIVE / PRESCRIPTION: <u>Maintain water quality in</u>
				<u>CLASS III Channels locate east and west unit boundaries above V-notch slope break.</u>
				<u>Sup 2(B) A/ Channel Types</u>
				WILDLIFE / IN HABITAT FOR OLD GROWTH SPECIES <u>Yes</u> (see attached)
				OBJECTIVE / PRESCRIPTION: <u>See streamside riparian</u>
				VISUAL / RECREATION / OBJECTIVE / PRESCRIPTION: <u>See attached</u>
				<u>Unit not assigned VPO of Max. lot.</u>
				CULTURAL / KNOWN SITE / PROBABILITY ZONE: HIGH — MEDIUM —
				OBJECTIVE / PRESCRIPTION: <u>Hilend yard, Fall and yard away from forest.</u>
				LOGGING SYSTEM / OBJECTIVE / PRESCRIPTION: <u>See attached</u>
				REMARKS: <u>Recreation: See attached</u>



# 81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)

VCU	<u>218</u>	EIS UNIT	<u>*35</u>	ACRES	<u>80</u>	LOGGING SYSTEM	<u>HL</u>	SILVICULTURE	OBJECTIVE / PRESCRIPTION: Clean cut harvest <del>follow unit natural</del> regeneration. High site index, will be under 90 (Four). monitor regeneration, and at option if commercial thin with a wide strip margin. Retain two snags per acre for diversity. Defeat back end of unit for leave strip between 35 and unit 23. Add substitute timber along <u>east edge of unit</u> .
STAND #	<u>4</u>	VOLUME FEIS	<u>280</u>	VOLUME CRUISE	—				
SALE NAME	<u>4A 03</u>								
PHOTO LINE AND NUMBER	<u>36 S - 116</u>								
OBJECTIVES	Provide volume for the 86 - 90 operating period.								
RESULTS OF MONITORING:									
ROAD LOCATION AND OBJECTIVE		CLOSED ROAD — OPEN ROAD —		OBJECTIVE / PRESCRIPTION: <u>Road grade to access this unit will probably exceed 15%</u>					
SOILS		HIGH HAZARD AREA		OBJECTIVE / PRESCRIPTION:					
S. A.									
PLANNED (ORTHO PHOTO)									
		SCALE: _____							
VISUAL RECREATION		CLASS I CROSSING — FHNU <del>III</del> TEMPERATURE SENSITIVITY: YES — NO <del>X</del>		CLASS II CROSSING — FHNU <del>III</del> WATER QUALITY AND CLASS III STREAMS. LOCATE unit boundary above <u>vertical slope break</u> . Sur 9/89		FISHERIES / HYDROLOGY			
WILDLIFE		IN HABITAT FOR OLD GROWTH SPECIES		NO (See attached)		OBJECTIVE / PRESCRIPTION: SEE ATTACHED <u>Assisted VQO = modification unit met assigned VQO</u>			
CULTURAL		KNOWN SITE —		PROBABILITY ZONE: HIGH — MEDIUM —		OBJECTIVE / PRESCRIPTION:			
LOGGING SYSTEM		OBJECTIVE / PRESCRIPTION: Headland fell and yard away from stream and hotel. Locate road so multiple landings can be used to reduce probability of blind leads.							
REMARKS: Reservation; See Attached									

**81 - 90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS.)**

VU 218 STAND #	EIS UNIT #	106 ACRES	100 LOGGING SYSTEM	L1	SILVICULTURE OBJECTIVE / PRESCRIPTION: Clear-cut following by natural regeneration. The upper 2/3 of this unit (uphill slopes) are highly productive sites. The lower more poorly drained slopes are poor sites (S1SS). AF: Site index is 85. Suggest straight felling leaning steep on south of unit and picking up additional volume from East side of unit - economic isolation.	
SALE NAME	VOLUME FEIS	1600	VOLUME CRUISE	—	SOILS OBJECTIVE / PRESCRIPTION: Retain an average of 2 swags per acre for drainage.	
PHOTO LINE AND NUMBER	A19 03	HIGH HAZARD AREA	—	HIGH HAZARD AREA OBJECTIVE / PRESCRIPTION:		
OBJECTIVES	Provide volume for the 86-90 operating period.				S.A.	
RESULTS OF MONITORING:						
ROAD LOCATION AND OBJECTIVE		CLOSED ROAD — OPEN ROAD —	OBJECTIVE / PRESCRIPTION: <b>Control vehicle access Alton House</b>			
NO						
FISHERIES / HYDROLOGY	CLASS I CROSSING FHNU	CLASS II CROSSING FHNU	CLASS III CROSSING FHNU	OBJECTIVE / PRESCRIPTION: <u>NO CONCERN'S IDENTIFIED</u>		
IN HABITAT FOR OLD GROWTH SPECIES NO (See attached)					JUL 9/89	
OBJECTIVE / PRESCRIPTION: Large unit causing the amount of past harvest in this drainage. Habitat diversity is a concern here.						
WILDLIFE	OBJECTIVE / PRESCRIPTION: SEE ATTACHED					
RECREATION	OBJECTIVE / PRESCRIPTION: Unit meets assigned VQUs of Mod. on upper half and of Max. Mod. on lower half.					
CULTURAL	KNOWN SITE — PROBABILITY ZONE : HIGH — MEDIUM —					OBJECTIVE / PRESCRIPTION :
LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION: High lead yard <20% slopes may be suitable for track/road yarding.					
REMARKS	Recreation: See attached					



86 - 90 UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED

VCU 219 EIS UNIT # 2 SERIALIZED # 2  
 SALE NAME AFC APP. 28 accr's  
 PHOTO LINE AND NUMBER 410 B DATE 12/7/-32

VCU 2161

SALE NAME

PHOTO LINE

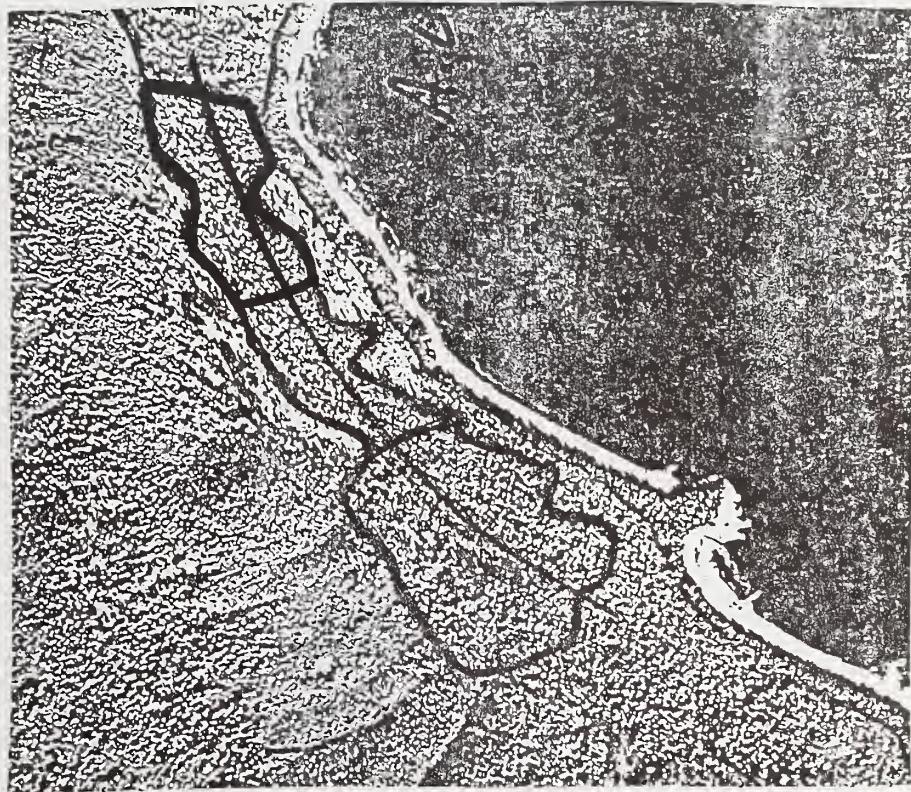
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## OBJECTIVES

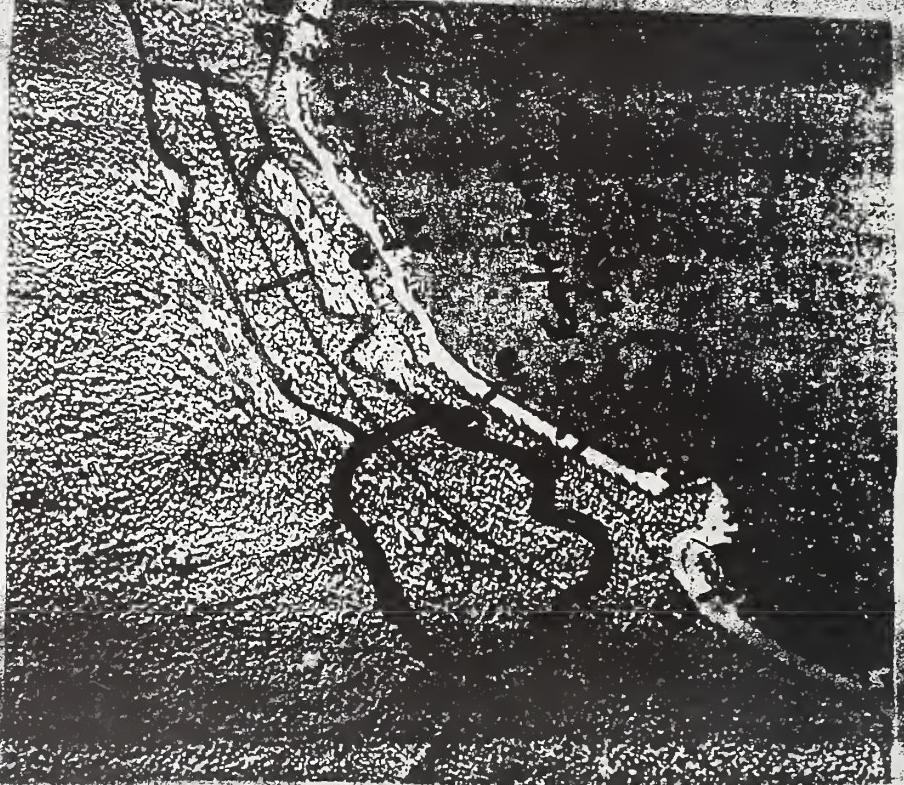
## OBJECTIVES

BIBLIOTHECA ROMANA



be shovel leveled. Permanent vegetation management will be followed by pre-commercial thinning with wildlife sympathetic cuts at age 12-15. Logging coverage of 30% songbird species for COSEWIC designated sensitive species.

### 86 - 90 UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 86-90 FEIS)

VOLUME	EIS UNIT #	ACRES	LOGGING SYSTEM	SILVICULTURE	OBJECTIVE / PRESCRIPTION:
ST	3	63	VOLUME CRUISE		looks to be a low risk area for soil loss. If available, or would result in reduced soil loss, clearcut followed by natural regeneration. Far site index is 100. Areas less than 20% slopes in plant associations Pisi/Oplo, Pisi/Vaccin/Tede/Vacci/Dew/Lech
SO	APC	1156		SOILS	HIGH HAZARD AREA
ND	- 86-90				OBJECTIVE / PRESCRIPTION:
ND NUMBER	40B	1276 - 32			
Q	Decreased size of this unit for wildlife and to leave a leave strip for Cutline. Also left beach fringe.				
RESULTS OF MONITORING:					
ROAD LOCATION AND OBJECTIVE		CLOSED ROAD — OPEN ROAD	OBJECTIVE / PRESCRIPTION:		
		Open to <del>General</del> traffic			
PLANNED (AERIAL PHOTO)		SCALE: 1:5200			
FISHERIES / HYDROLOGY		CLASS I CROSSING	CLASS II CROSSING	CLASS III CROSSING	
		<input checked="" type="checkbox"/>	<input type="checkbox"/>	NO	
OBJECTIVE / PRESCRIPTION:		No fisheries concerns. Hydro review: Protect several prospect channel/directional cutting away from cutline			
		DK / 9-12-89			
WILDLIFE		IN HABITAT FOR OLD GROWTH SPECIES YES (see attached)			
OBJECTIVE / PRESCRIPTION:		West of dam and east of road must remain more than 330' from Eagle nest to 45'. Any cut 15' or deeper within range of species habitat is subject to partial retention.			
VISUAL RECREATION		Unit does not meet Assigned VQO of Partial Retention. VQA achieved is Modification. SEE ATTACHED			
CULTURAL		KNOWN SITE PROBABILITY ZONE: HIGH — MEDIUM			
LOGGING SYSTEM		OBJECTIVE / PRESCRIPTION: H/le/ed Yard, Fell and yard away from Stream channels.			
REMARKS		Recreation: See attached			

# 81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS!)

VCU	EIS UNIT	36	ACRES	60	LOGGING SYSTEM	HC
STAND *	VOLUME FEIS	960	VOLUME CRUISE	—	SUBCULTURE OBJECTIVE / PRESCRIPTION: clear cut followed by natural regeneration. Ave. site size is 80 ft x 80 ft.	
SALE NAME	AA 03	Retain 2 subgoals per acre for diversity. Consider varying backline on east boundary to pick up areas of timber that simpler off-timber less susceptible.				
PHOTO LINE AND NUMBER						
<u>OBJECTIVES</u>	Provide volume for the 86-90 operating period.					
RESULTS OF MONITORING:						
ROAD LOCATION AND OBJECTIVE		CLOSED ROAD	OPEN ROAD	OBJECTIVE / PRESCRIPTION:		
		<b>Cultural Vehicle Access</b>				
PLANNED (ORTHO PHOTO)						
SCALE: —						
						
REMARKS: See attached						
FISHERIES / HYDROLOGY		CLASS I CROSSING	CLASS II CROSSING	CLASS III CROSSING	—	
FMNU & TEMPERATURE		YES	NO	—	—	
OBJECTIVE / PRESCRIPTION:		No concerns identified, if maintained present boundaries			DK 9/12/89	
PRESENT BOUNDARIES						
WILDLIFE		IN HABITAT FOR <del>COYOTE</del> SPECIES Yes				
RECREATION		OBJECTIVE / PRESCRIPTION: Best unit size to maintain deer winter range habitat values is 10 acres or less.				
VISUAL		OBJECTIVE / PRESCRIPTION: SITE ATTACHED AS 16x100' PO PARKER POSITION				
LOGGING SYSTEM		OBJECTIVE / PRESCRIPTION: Hi lead yard. S/pes < 20% may be suitable for track ladder yarding				
CULTURAL		KNOWN SITE	PROBABILITY ZONE	HIGH	MEDIUM	—
		OBJECTIVE / PRESCRIPTION:				

**81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)**

VCU <u>219</u>	EIS UNIT # <u>39</u>	ACRES <u>2.5</u>	LOGGING SYSTEM <u>LL</u>	SILVICULTURE by cut regen. This is a low to medium productive site. Average site index is 70 (Fm). Retain an acre. of 2 snags per acre for diversity.	OBJECTIVE / PRESCRIPTION: Clean out harvest hollows
STAND # <u> </u>	VOLUME FEIS <u>66.5</u>	VOLUME CRUISE <u> </u>	SOILS	HIGH HAZARD AREA protect V-notch from shoulder slope split-type d.	OBJECTIVE / PRESCRIPTION: protect V-notch from shoulder slope
SALE NAME <u>AA 03</u>	PHOTO LINE AND NUMBER	RESULTS OF MONITORING: ROAD LOCATION AND OBJECTIVE	CLOSED ROAD <u>Block vehicle access &amp; allow to grow close</u>	OPEN ROAD	OBJECTIVE / PRESCRIPTION: allow to
OBJECTIVES Provide volume for the 86-90 operating period.		FISHERIES / HYDROLOGY	CLASS I CROSSING <u> </u> FHMU <u> </u> OBJECTIVE / PRESCRIPTION: No concerns, den/fed	CLASS II CROSSING <u> </u> TEMPERATURE SENSITIVITY: YES <u> </u> NO <u> </u> OBJECTIVE / PRESCRIPTION: No concerns, den/fed	CLASS III CROSSING <u> </u>
		WILDLIFE	IN HABITAT FOR OLD GROWTH SPECIES <u>NO</u> (see attached)	WILDLIFE	WILDLIFE 9/2/69
		VISUAL RECREATION	SPFS ATTACHED	CULTURAL	KNOWN SITE: PROBABILITY ZONE: HIGH — MEDIUM — OBJECTIVE / PRESCRIPTION:
		LOGGING SYSTEM	Logging system: yard away from v-notches. sp/fit settings w/ landings between v-notches	REMARKS	Recreation: see attached



# 81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)

VCU	EIS UNIT #	155	ACRES	55	LOGGING SYSTEM HC	SILVICULTURE	OBJECTIVE / PRESCRIPTION: Harvest harvest fell, 1st, 2nd.	
STAND #	VOLUME FEIS	880	VOLUME CRUISE	—	Average site index is 98 (Fav). Monitor regeneration and at age 12-18 yrs. pre-commercial thinning & selective cut harvest.	Pilot an area of 2 square miles for diversity. Don't include low risk areas.	OBJECTIVE / PRESCRIPTION: Young growth of east borer day.	
SALE NAME	4H 03	—	—	—	—	—	OBJECTIVE / PRESCRIPTION: —	
PHOTO LINE AND NUMBER	45 - 484-76	—	—	—	—	—	OBJECTIVE / PRESCRIPTION: —	
<u>OBJECTIVES</u>	Provide volume for the 86-90 operating period.							
RESULTS OF MONITORING:		ROAD LOCATION AND OBJECTIVE		CLOSED ROAD — OPEN ROAD —		OBJECTIVE / PRESCRIPTION:		
PLANNED (ORTHO PHOTO)		SCALE: —		Open to General traffic		—		
								
WILDLIFE	IN HABITAT FOR OLD-GROWTH SPECIES	YES	(See attached)	CLASS I CROSSING	CLASS II CROSSING	CLASS III CROSSING	—	
	OBJECTIVE / PRESCRIPTION:			FMNU ALL TEMPERATURE SENSITIVITY: YES — NO	RIGHT ANGLE DIRECTION	—	—	
	Best unit size to manage emphasis species habitat		PROTECT frontage channel with right angle direction.		MAINTAIN ROAD CROSSINGS STRUCTURE ANNUALLY.		FALLING away from channel.	
VISUAL RECREATION	OBJECTIVE / PRESCRIPTION:	SEE ATTACHED		ASSIGNED VPO PARENT PERTINENT		Unit does not meet assigned VPO		
CULTURAL	KNO'N SITE	PROBABILITY ZONE : HIGH — MEDIUM —		OBJECTIVE / PRESCRIPTION:		—		
LOGGING SYSTEM	OBJECTIVE / PRESCRIPTION: Grabinski yard. Fall and yard away from J notes.							
<u>REMARKS</u> : Location: see attached								

**81-90 SEIS UNIT LAYOUT AND ROAD LOCATION CARD - PLANNED (AS PER 81-90 SEIS)**

YCU <u>219</u>	EIS UNIT * <u>154</u>	ACRES <u>60</u>	LOGGING SYSTEM <u>HL</u>	SILVICULTURE Younger second growth stand in alluvial fan areas. If left unharvested, it will be susceptible to windthrow. Prescribe non-timber regeneration followed with precommercial thinning with wildlife emphasis at ages 12-13 years. Late cutting of timber stands due to	OBJECTIVE / PRESCRIPTION: Cleared harvested areas. Long term objectives include reduced soil erosion and habitat diversity.	
STAND # <u>*</u>	VOLUME FEIS <u>1/72</u>	VOLUME CRUISE _____	SALE NAME <u>AA O3</u>	PHOTO LINE AND NUMBER <u>95 - 484-76</u>	SOILS HIGH HAZARD AREA _____	OBJECTIVE / PRESCRIPTION: Open to general traffic
<b>OBJECTIVES</b> Provide volume for the 86-90 operating period.				RESULTS OF MONITORING:		
PLANNED (ORTHO PHOTO)		SCALE: _____	ROAD LOCATION AND OBJECTIVE	CLOSED ROAD _____	OPEN ROAD _____	OBJECTIVE / PRESCRIPTION: Open to general traffic
FISHERIES / HYDROLOGY	CLASS I CROSSING _____	CLASS II CROSSING _____	CLASS III CROSSING _____	FISH & WILDLIFE HABITAT FOR <del>ENDANGERED</del> SPECIES <u>Yes</u> (see attached)		
OBJECTIVE / PRESCRIPTION: Best unit size to maintain habitat diversity in emphasis species habitat is 10 acres or less. <u>30 ac. Duff</u> <u>60 ac. Old growth</u>		FMNU & DE TEMPERATURE SENSITIVITY: YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>		WILDLIFE IN HABITAT FOR <del>ENDANGERED</del> SPECIES <u>Yes</u> (see attached)		
RECREATION	VISUAL ASSESSMENT	ASSOCIATED WITH PHASED RETENTION	OBJECTIVE / PRESCRIPTION: SEE ATTACHED	CULTURAL KNOWN SITE _____ PROBABILITY ZONE : HIGH <input type="checkbox"/> MEDIUM <input type="checkbox"/>		
LOGGING SYSTEM		OBJECTIVE / PRESCRIPTION: Grabinski yard on one end suspension, fell and yard away from unbroken.				
<b>REMARKS</b>		Recreation: See Attached				



81-90 SEIS

ROAD LOCATION AND CONSTRUCTION RECOMMENDATIONS

(Block)

AREA # 3 Recommended on Grand Not Lcatal ROAD NUMBER 853645

<u>RESOURCE</u>	<u>RESOURCE CONSIDERATION/RECOMMENDATIONS</u>
-----------------	---

CULTURAL

FISHERIES

No concerns

LANDS

RECREATION

See Attached

SOILS

No concerns

TIMBER

(Silviculture/Logging System)

VISUAL

SEE ATTACHED

WATER

No Concerns

WILDLIFE

(See attached)

## ROAD LOCATION AND CONSTRUCTION RECOMMENDATIONS

AREA #	3	ROAD NUMBER	85092
<u>RESOURCE</u>	<u>RESOURCE CONSIDERATION/RECOMMENDATIONS</u>		
<u>CULTURAL</u>			
<u>FISHERIES</u>			
<u>LANDS</u>			
<u>RECREATION</u>	<i>See attached. Possible Rec. site - Campgrou</i>		
<u>SOILS</u>			
<u>TIMBER</u>	(Silviculture/Logging System)		
<u>VISUAL</u>			
<u>WATER</u>			
<u>WILDLIFE</u>			

## ROAD LOCATION AND CONSTRUCTION RECOMMENDATIONS

AREA # 3 Located & Surveyed <sup>control block left</sup> ROAD NUMBER 8504

<u>RESOURCE</u>	<u>RESOURCE CONSIDERATION/RECOMMENDATIONS</u>
<u>CULTURAL</u>	

<u>FISHERIES</u>	2 CLASS II CROSSINGS - see attached.
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<u>LANDS</u>	
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<u>RECREATION</u>	See attached -
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<u>SOILS</u>	See attached
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<u>TIMBER</u>	(Silviculture/Logging System)
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<u>VISUAL</u>	SEE ATTACHED
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<u>WATER</u>	See attached
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<u>WILDLIFE</u>	see attached
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## ROAD LOCATION AND CONSTRUCTION RECOMMENDATIONS

AREA # 32 Located & Surveyed Control access ROAD NUMBER 8576

<u>RESOURCE</u>	RESOURCE CONSIDERATION/RECOMMENDATIONS
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<u>CULTURAL</u>	
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<u>FISHERIES</u>	
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*see water*

<u>LANDS</u>	
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<u>RECREATION</u>	<i>See attached - potential for fishing access at Seagull Creek -</i>
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<u>SOILS</u>	No concerns
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<u>TIMBER</u>	(Silviculture/Logging System)
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<u>VISUAL</u>	<i>SEE ATTACHED</i>
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<u>WATER</u>	<i>CLASS II crossing.</i>
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<u>WILDLIFE</u>	<i>(See attached)</i>
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81-90 SEIS

## ROAD LOCATION AND CONSTRUCTION RECOMMENDATIONS

AREA # 3      Not Located      Control Access      ROAD NUMBER 8504X

<u>RESOURCE</u>	RESOURCE CONSIDERATION/RECOMMENDATIONS
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<u>CULTURAL</u>	
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<u>FISHERIES</u>	
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see water

<u>LANDS</u>	
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<u>RECREATION</u>	See Attached - Possible recreation sites - Pull off w/ trail access to Game Creek for fishing, parallel trail running next to Game Creek, recreation cabin for hunting or fishing
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<u>SOILS</u>	No concerns
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<u>TIMBER</u>	(Silviculture/Logging System)
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<u>VISUAL</u>	SEE ATTACHED
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<u>WATER</u>	See attached
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<u>WILDLIFE</u>	see attached
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## ROAD LOCATION AND CONSTRUCTION RECOMMENDATIONS

AREA # 3 Located & Surveyed *Control traffic* ROAD NUMBER 8502

RESOURCE	RESOURCE CONSIDERATION/RECOMMENDATIONS
CULTURAL	

FISHERIES	2 CLASS I crossings - see attached.
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LANDS	
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RECREATION	See Attached - Possible recreation sites - Alpine trail to small lake on Vortex Ridge, Pull offs w/ trail access to Game Creek for fishing, parallel trail running next to Game Creek, recreation cabin for hunting or fishing
SOILS	See attached

TIMBER	(Silviculture/Logging System)
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VISUAL	SEE ATTACHED
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WATER	See attached
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WILDLIFE	See attached
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## ROAD LOCATION AND CONSTRUCTION RECOMMENDATIONS

AREA # 3 Located & Surveyed to unit 13 ROAD NUMBER 8534

<u>RESOURCE</u>	RESOURCE CONSIDERATION/RECOMMENDATIONS
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<u>CULTURAL</u>	
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<u>FISHERIES</u>	
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*CLASS I/II stream crossing. See attached.*

<u>LANDS</u>	
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<u>RECREATION</u>	<i>See Attached - Possible recreation site</i>
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<u>SOILS</u>	No concerns
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<u>TIMBER</u>	(Silviculture/Logging System)
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<u>VISUAL</u>	<i>See Attached</i>
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<u>WATER</u>	<i>See attached</i>
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<u>WILDLIFE</u>	<i>(See attached)</i>
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## ROAD LOCATION AND CONSTRUCTION RECOMMENDATIONS

AREA # 3 Recommended on Ground not located ROAD NUMBER 8536

<u>RESOURCE</u>	<u>RESOURCE CONSIDERATION/RECOMMENDATIONS</u>
<u>CULTURAL</u>	

<u>FISHERIES</u>
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NO CONCERN'S

<u>LANDS</u>
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<u>RECREATION</u>	<u>See attached -</u>
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<u>SOILS</u>	<u>No concerns</u>
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<u>TIMBER</u>	(Silviculture/Logging System) Silviculture - Gras seed road running along cut banks, and fill slopes after harvest is completed to reduce the frequency of alder seed sources and protect the roadbed investment Keep this road open to administrative access.
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<u>VISUAL</u>	<u>SEE ATTACHED</u>
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<u>WATER</u>	<u>No concerns</u>
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<u>WILDLIFE</u>	<u>(See attached)</u>
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81-90 SEIS

Grant to General Trillium

## ROAD LOCATION AND CONSTRUCTION RECOMMENDATIONS

AREA # 3 Located & Surveyed ROAD NUMBER 8530

<u>RESOURCE</u>	RESOURCE CONSIDERATION/RECOMMENDATIONS
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<u>CULTURAL</u>	
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<u>FISHERIES</u>	sea water
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<u>LANDS</u>	
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<u>RECREATION</u>	See Attached - Possible recreation site at the mouth of Wuhablook Creek close to bridge crossing. Fishing access, possible camping site.
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<u>SOILS</u>	No concerns
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<u>TIMBER</u>	(Silviculture/Logging System)
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<u>VISUAL</u>	See Attached
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<u>WATER</u>	CLASS II $\frac{1}{2}$ TEE crossings - see attached.
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<u>WILDLIFE</u>	(see attached)
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81-90 SEIS

## ROAD LOCATION AND CONSTRUCTION RECOMMENDATIONS

*Block*

AREA # <u>3</u>	<u>Not Located Beyond Existing</u>	ROAD NUMBER <u>85091</u>
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<u>RESOURCE</u>	RESOURCE CONSIDERATION/RECOMMENDATIONS
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<u>CULTURAL</u>	
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<u>FISHERIES</u>	
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	<i>See water</i>
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<u>LANDS</u>	
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<u>RECREATION</u>	<i>See Attached -</i>
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<u>SOILS</u>	<i>No concerns</i>
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<u>TIMBER</u>	(Silviculture/Logging System)
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<u>VISUAL</u>	<i>See ATTACHED</i>
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<u>WATER</u>	<i>See attached</i>
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<u>WILDLIFE</u>	<i>(See attached)</i>
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## ROAD LOCATION AND CONSTRUCTION RECOMMENDATIONS

AREA # 3 Located & Surveyed *Continued traffic* ROAD NUMBER 85029

<u>RESOURCE</u>	<u>RESOURCE CONSIDERATION/RECOMMENDATIONS</u>
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<u>CULTURAL</u>	
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<u>FISHERIES</u>	
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*see water*

<u>LANDS</u>	
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<u>RECREATION</u>	<i>See attached</i>
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<u>SOILS</u>	<i>See attached</i>
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<u>TIMBER</u>	(Silviculture/Logging System)
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<u>VISUAL</u>	<i>See attached</i>
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<u>WATER</u>	<i>See attached</i>
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<u>WILDLIFE</u>	<i>See attached</i>
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81-90 SEIS

## ROAD LOCATION AND CONSTRUCTION RECOMMENDATIONS

AREA # 3 Not Located Allow to grow closed ROAD NUMBER 850831

<u>RESOURCE</u>	<u>RESOURCE CONSIDERATION/RECOMMENDATIONS</u>
CULTURAL	

<u>FISHERIES</u>
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NO CONCERN'S

<u>LANDS</u>
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<u>RECREATION</u>
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No Concern's

<u>SOILS</u>
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No concerns

<u>TIMBER</u>
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(Silviculture/Logging System)

<u>VISUAL</u>
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NO CONCERN

<u>WATER</u>
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No concerns

<u>WILDLIFE</u>
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(See attached)

81-90 SEIS

## ROAD LOCATION AND CONSTRUCTION RECOMMENDATIONS

*allow to grow closed*

AREA # 3

Not Located

ROAD NUMBER

85102

RESOURCE

RESOURCE CONSIDERATION/RECOMMENDATIONS

CULTURAL

FISHERIES

No concerns

LANDS

RECREATION

*No concerns*

SOILS

No concerns

TIMBER

(Silviculture/Logging System)

VISUAL

NO CONCERN

WATER

No concerns

WILDLIFE

See attached

81-90 SEIS

## ROAD LOCATION AND CONSTRUCTION RECOMMENDATIONS

AREA # 3 Located / Surveyed <sup>allow to grow closed</sup> ROAD NUMBER 86101

<u>RESOURCE</u>	RESOURCE CONSIDERATION/RECOMMENDATIONS
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<u>CULTURAL</u>	
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<u>FISHERIES</u>	
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	No concerns
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<u>LANDS</u>	
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<u>RECREATION</u>	No concerns
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<u>SOILS</u>	
--------------	--

	No concerns
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<u>TIMBER</u>	(Silviculture/Logging System)
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<u>VISUAL</u>	No concern
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<u>WATER</u>	
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	No concern
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<u>WILDLIFE</u>	(See attached)
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81-90 SEIS

## ROAD LOCATION AND CONSTRUCTION RECOMMENDATIONS

AREA # 3 Located / Surveyed disourage wild traffic  
ROAD NUMBER 86102

RESOURCE	RESOURCE CONSIDERATION/RECOMMENDATIONS
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<u>CULTURAL</u>	
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<u>FISHERIES</u>	
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NO CONCERN'S

<u>LANDS</u>	
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<u>RECREATION</u>	<u>No Concerns</u>
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<u>SOILS</u>	See attached
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<u>TIMBER</u>	(Silviculture/Logging System)
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<u>VISUAL</u>	<u>NO CONCERN</u>
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<u>WATER</u>	
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No concerns

<u>WILDLIFE</u>	(See attached)
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81-90 SEIS

## ROAD LOCATION AND CONSTRUCTION RECOMMENDATIONS

AREA # 3 Located / Survey Control vehicle traffic ROAD NUMBER 8610

RESOURCE RESOURCE CONSIDERATION/RECOMMENDATIONS

CULTURAL

FISHERIES see attached sheet

LANDS

RECREATION No Concerns

SOILS No soil concerns

TIMBER (Silviculture/Logging System)

VISUAL NO CONCERN

WATER See attached

WILDLIFE (See attached)

81-90 SEIS

## ROAD LOCATION AND CONSTRUCTION RECOMMENDATIONS

AREA # 3      Not located      Should go <sup>Closed</sup>      ROAD NUMBER 850931

<u>RESOURCE</u>	<u>RESOURCE CONSIDERATION/RECOMMENDATIONS</u>
<u>CULTURAL</u>	

FISHERIES*See water*LANDSRECREATION*See Attached*SOILS

No concerns

TIMBER

(Silviculture/Logging System)

VISUAL*See Attached*WATER

CLASS II CROSSINGS.

LANDING SHOULD BE ~~BE~~ LOCATED AND DESIGNED TO  
MEET WATER QUALITY OBJECTIVES. See attached

511

WILDLIFE

(See attached)

81-90 SEIS

## ROAD LOCATION AND CONSTRUCTION RECOMMENDATIONS

AREA # 3 Recommended <sup>allowable to cross</sup> ~~Closed~~ ROAD NUMBER 85082

<u>RESOURCE</u>	RESOURCE CONSIDERATION/RECOMMENDATIONS
<u>CULTURAL</u>	

FISHERIESCLASS I CROSSING  
see attached.LANDSRECREATION

No Concerns

SOILS

No concerns

TIMBER

(Silviculture/Logging System)

VISUAL

No concern

WATER

See attached

WILDLIFE

(See attached)

81-90 SEIS

## ROAD LOCATION AND CONSTRUCTION RECOMMENDATIONS

AREA # 3 Not located allow to open close ROAD NUMBER 85291

<u>RESOURCE</u>	<u>RESOURCE CONSIDERATION/RECOMMENDATIONS</u>
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<u>CULTURAL</u>	
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<u>FISHERIES</u>	
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No concerns

<u>LANDS</u>	
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<u>RECREATION</u>	<u>See attached</u>
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<u>SOILS</u>	No concerns
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<u>TIMBER</u>	(Silviculture/Logging System)
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<u>VISUAL</u>	<u>SEE ATTACHED</u>
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<u>WATER</u>	No concerns
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<u>WILDLIFE</u>	<u>(See attached)</u>
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81-90 SEIS

allow to grow closed

## ROAD LOCATION AND CONSTRUCTION RECOMMENDATIONS

AREA # 3 Not located Beyond Existing ROAD NUMBER 85/92

<u>RESOURCE</u>	<u>RESOURCE CONSIDERATION/RECOMMENDATIONS</u>
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<u>CULTURAL</u>	
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<u>FISHERIES</u>	
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No concerns

<u>LANDS</u>	
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<u>RECREATION</u>	<u>See attached</u>
-------------------	---------------------

<u>SOILS</u>	No concerns
--------------	-------------

<u>TIMBER</u>	(Silviculture/Logging System)
---------------	-------------------------------

<u>VISUAL</u>	<u>SEE ATTACHED</u>
---------------	---------------------

<u>WATER</u>	No concerns
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<u>WILDLIFE</u>	(See attached)
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81-90 SEIS

## ROAD LOCATION AND CONSTRUCTION RECOMMENDATIONS

AREA # 3 Located & Surveyed <sup>Control vehicle access</sup> ROAD NUMBER 8529

RESOURCE RESOURCE CONSIDERATION/RECOMMENDATIONS

CULTURAL

FISHERIES

*NO CONCERN'S*

LANDS

RECREATION *See attached*

SOILS No concerns

TIMBER (Silviculture/Logging System)

VISUAL *SEE ATTACHED*

WATER No concerns

WILDLIFE *(see attached)*

## ROAD LOCATION AND CONSTRUCTION RECOMMENDATIONS

AREA # 3 not Located Discourage traffic ROAD NUMBER 85171

RESOURCE	RESOURCE CONSIDERATION/RECOMMENDATIONS
CULTURAL	

<u>FISHERIES</u>	<i>NO CONCERNs</i>
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<u>LANDS</u>	
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<u>RECREATION</u>	<i>See attached</i>
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<u>SOILS</u>	<i>See attached</i>
--------------	---------------------

<u>TIMBER</u>	(Silviculture/Logging System)
---------------	-------------------------------

<u>VISUAL</u>	<i>SEE ATTACHED</i>
---------------	---------------------

<u>WATER</u>	<i>See attached</i>
--------------	---------------------

<u>WILDLIFE</u>	<i>(See attached)</i>
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81-90 SEIS

## ROAD LOCATION AND CONSTRUCTION RECOMMENDATIONS

AREA # 3 located & Surveyed allow to grow closed ROAD NUMBER 85341

<u>RESOURCE</u>	<u>RESOURCE CONSIDERATION/RECOMMENDATIONS</u>
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<u>CULTURAL</u>	
-----------------	--

<u>FISHERIES</u>	
------------------	--

NO CONCERN'S

<u>LANDS</u>	
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<u>RECREATION</u>	<u>See attached</u>
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<u>SOILS</u>	No concerns
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<u>TIMBER</u>	(Silviculture/Logging System)
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<u>VISUAL</u>	<u>SEE ATTACHED</u>
---------------	---------------------

<u>WATER</u>	No concerns
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<u>WILDLIFE</u>	(See attached)
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81-90 SEIS

## ROAD LOCATION AND CONSTRUCTION RECOMMENDATIONS

AREA # 3 not located allows to grow closed ROAD NUMBER 85292

<u>RESOURCE</u>	<u>RESOURCE CONSIDERATION/RECOMMENDATIONS</u>
<u>CULTURAL</u>	
<u>FISHERIES</u>	

*no concerns*

<u>LANDS</u>	
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<u>RECREATION</u>	<i>See attached</i>
-------------------	---------------------

<u>SOILS</u>	No concerns
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<u>TIMBER</u>	(Silviculture/Logging System)
---------------	-------------------------------

<u>VISUAL</u>	<i>SEE ATTACHED</i>
---------------	---------------------

<u>WATER</u>	No concerns
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<u>WILDLIFE</u>	<i>(See attached)</i>
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## 81-90 SEIS

## ROAD LOCATION AND CONSTRUCTION RECOMMENDATIONS

AREA # 3 Not Located allow to grow dense ROAD NUMBER 85293

RESOURCE	RESOURCE CONSIDERATION/RECOMMENDATIONS
----------	--

CULTURAL	
----------	--

FISHERIES	
-----------	--

*no concerns*

LANDS	
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RECREATION	<i>see attached</i>
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SOILS	No concerns
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TIMBER	(Silviculture/Logging System)
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VISUAL	<i>see attached</i>
--------	---------------------

WATER	No concerns
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WILDLIFE	<i>see attached</i>
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81-90 SEIS

## ROAD LOCATION AND CONSTRUCTION RECOMMENDATIONS

AREA # 3 Not Located ROAD NUMBER 8530154

Block

RESOURCE	RESOURCE CONSIDERATION/RECOMMENDATIONS
CULTURAL	
FISHERIES	

NO CONCERNs

LANDS	
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RECREATION	<u>See Attached</u>
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SOILS	No concerns
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TIMBER	(Silviculture/Logging System)
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VISUAL	<u>See Attached</u>
--------	---------------------

WATER	No concerns
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WILDLIFE	(See attached)
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81-90 SEIS

## ROAD LOCATION AND CONSTRUCTION RECOMMENDATIONS

AREA # 3

Located &amp; Surveyed

allow to follow Creek

ROAD NUMBER 86104

RESOURCE

RESOURCE CONSIDERATION/RECOMMENDATIONS

CULTURAL

FISHERIES

See attached. Class I crossings  
see water

LANDS

RECREATION

See Attached

SOILS

See attached

TIMBER

(Silviculture/Logging System)

VISUAL

SEE ATTACHED

WATER

See attached

WILDLIFE

(See attached)

81-90 SEIS

allow to grow closed

## ROAD LOCATION AND CONSTRUCTION RECOMMENDATIONS

AREA # 3 Recommended Not Located ROAD NUMBER 85103

<u>RESOURCE</u>	RESOURCE CONSIDERATION/RECOMMENDATIONS
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<u>CULTURAL</u>	
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<u>FISHERIES</u>	
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*See water*

<u>LANDS</u>	
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<u>RECREATION</u>	<i>See Attached</i>
-------------------	---------------------

<u>SOILS</u>	No concerns
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<u>TIMBER</u>	(Silviculture/Logging System)
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<u>VISUAL</u>	<i>SEE ATTACHED</i>
---------------	---------------------

<u>WATER</u>	CLASS II CROSSINGS:
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<u>WILDLIFE</u>	<i>see attached</i>
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81-90 SEIS

## ROAD LOCATION AND CONSTRUCTION RECOMMENDATIONS

AREA # 3 Located & Surveyed (Block) ROAD NUMBER 853041

RESOURCE	RESOURCE CONSIDERATION/RECOMMENDATIONS
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CULTURAL	
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FISHERIES	<u>CLASS I crossing.</u> "see attached."
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LANDS	
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RECREATION	<u>See Attached</u>
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SOILS	No concerns
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TIMBER	(Silviculture/Logging System)
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VISUAL	<u>SEE ATTACHED</u>
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WATER	See attached
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WILDLIFE	See attached
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81-90 SEIS

## ROAD LOCATION AND CONSTRUCTION RECOMMENDATIONS

AREA # 3 Located & Survey to unit 7 <sup>located to</sup> unit 4 ROAD NUMBER 86105 *Allows to a new closed*

<u>RESOURCE</u>	<u>RESOURCE CONSIDERATION/RECOMMENDATIONS</u>
<u>CULTURAL</u>	

<u>FISHERIES</u>	
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*See water*

<u>LANDS</u>	
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<u>RECREATION</u>	<i>See Attached</i>
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<u>SOILS</u>	<i>See attached</i>
--------------	---------------------

<u>TIMBER</u>	(Silviculture/Logging System)
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<u>VISUAL</u>	<i>SEE ATTACHED</i>
---------------	---------------------

<u>WATER</u>	<i>See attached</i>
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<u>WILDLIFE</u>	<i>(See attached)</i>
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81-90 SEIS

## ROAD LOCATION AND CONSTRUCTION RECOMMENDATIONS

AREA # 3 Not Located *View to gneus closed* ROAD NUMBER 85 765

<u>RESOURCE</u>	RESOURCE CONSIDERATION/RECOMMENDATIONS
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<u>CULTURAL</u>	
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<u>FISHERIES</u>	
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*No concerns - see water*

<u>LANDS</u>	
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<u>RECREATION</u>	<i>See Attached</i>
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<u>SOILS</u>	No concerns
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<u>TIMBER</u>	(Silviculture/Logging System)
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<u>VISUAL</u>	<i>SEE ATTACHED</i>
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<u>WATER</u>	<i>See attached</i>
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<u>WILDLIFE</u>	<i>(see attached)</i>
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81-90 SEIS

## ROAD LOCATION AND CONSTRUCTION RECOMMENDATIONS

AREA # 3 Not Located *Allows to grow closed* ROAD NUMBER 85764

<u>RESOURCE</u>	<u>RESOURCE CONSIDERATION/RECOMMENDATIONS</u>
CULTURAL	

<u>FISHERIES</u>	
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*No concerns*

<u>LANDS</u>	
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<u>RECREATION</u>	<i>See Attached</i>
-------------------	---------------------

<u>SOILS</u>	No concerns
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<u>TIMBER</u>	(Silviculture/Logging System)
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<u>VISUAL</u>	<i>SEE ATTACHED</i>
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<u>WATER</u>	<i>See Attached</i>
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<u>WILDLIFE</u>	<i>(See attached)</i>
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81-90 SEIS

## ROAD LOCATION AND CONSTRUCTION RECOMMENDATIONS

AREA # 3Not Located*→ New to grow closed*

ROAD NUMBER

85761

RESOURCE

RESOURCE CONSIDERATION/RECOMMENDATIONS

CULTURALFISHERIES

CLASS II crossing see attached water concerns.

LANDSRECREATION*See Attached*SOILS

No concerns

TIMBER

(Silviculture/Logging System)

VISUAL*See Attached*WATER*See attached*WILDLIFE*(See attached)*

81-90 SEIS

## ROAD LOCATION AND CONSTRUCTION RECOMMENDATIONS

AREA # 3 Located & Survey Control vehicle use ROAD NUMBER 85381

<u>RESOURCE</u>	<u>RESOURCE CONSIDERATION/RECOMMENDATIONS</u>
<u>CULTURAL</u>	

<u>FISHERIES</u>
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*No concerns*

<u>LANDS</u>
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<u>RECREATION</u>	<i>See Attached</i>
-------------------	---------------------

<u>SOILS</u>	<i>No concerns</i>
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<u>TIMBER</u>	(Silviculture/Logging System)
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<u>VISUAL</u>	<i>SEE ATTACHED</i>
---------------	---------------------

<u>WATER</u>	<i>See attached</i>
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<u>WILDLIFE</u>	<i>(See attached)</i>
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## ROAD LOCATION AND CONSTRUCTION RECOMMENDATIONS

AREA # 3 Not Located (Block) ROAD NUMBER 85362

RESOURCE RESOURCE CONSIDERATION/RECOMMENDATIONS

CULTURAL

FISHERIES CLASS I crossings see attached

LANDS

RECREATION See attached

SOILS No concerns

TIMBER (Silviculture/Logging System)

VISUAL SEE ATTACHED

WATER See attached

WILDLIFE See attached

## ROAD LOCATION AND CONSTRUCTION RECOMMENDATIONS

(Blank)

AREA #	<u>3</u>	<u>not located</u>	<u>Recommended</u>	ROAD NUMBER	<u>85366</u>
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RESOURCE	RESOURCE CONSIDERATION/RECOMMENDATIONS			
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CULTURAL				
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FISHERIES				
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See water quality concern -

LANDS				
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RECREATION	<u>See Attached</u>			
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SOILS	Cross high and extreme risk areas between Units 211-1 & 211-2			
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TIMBER	(Silviculture/Logging System)			
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VISUAL	<u>SEE ATTACHED</u>			
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WATER	Crosses one stream - <u>CLASS III</u>			
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WILDLIFE	(See attached)			
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## ROAD LOCATION AND CONSTRUCTION RECOMMENDATIONS

AREA # 3 Not Located (Block) & ROAD NUMBER 85361

RESOURCE RESOURCE CONSIDERATION/RECOMMENDATIONS

CULTURAL

FISHERIES

NO CONCERN'S

LANDS

RECREATION See Attached

SOILS No concerns

TIMBER (Silviculture/Logging System)

VISUAL SEE ATTACHED

WATER Water quality concerns - see attached

WILDLIFE (See attached)

Block

81-90 SEIS

## ROAD LOCATION AND CONSTRUCTION RECOMMENDATIONS

(Block)

AREA # 3 Recovered on Ground not located ROAD NUMBER 853643

<u>RESOURCE</u>	<u>RESOURCE CONSIDERATION/RECOMMENDATIONS</u>
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<u>CULTURAL</u>	
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<u>FISHERIES</u>	
------------------	--

*No concerns.*

<u>LANDS</u>	
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<u>RECREATION</u>	<i>See Attached</i>
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<u>SOILS</u>	No concerns
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<u>TIMBER</u>	(Silviculture/Logging System)
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<u>VISUAL</u>	<i>SEE ATTACHED</i>
---------------	---------------------

<u>WATER</u>	No concerns
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<u>WILDLIFE</u>	<i>See attached</i>
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81-90 SEIS

## ROAD LOCATION AND CONSTRUCTION RECOMMENDATIONS

(Block)

AREA # 3 Reconned on Ground Not Located ROAD NUMBER 8536 1/

<u>RESOURCE</u>	<u>RESOURCE CONSIDERATION/RECOMMENDATIONS</u>
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<u>CULTURAL</u>	
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<u>FISHERIES</u>	
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See water concerns.

<u>LANDS</u>	
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<u>RECREATION</u>	See Attached
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<u>SOILS</u>	No concerns
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<u>TIMBER</u>	(Silviculture/Logging System)
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<u>VISUAL</u>	SEE ATTACHED
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<u>WATER</u>	See attached for water quality considerations
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<u>WILDLIFE</u>	See attached
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81-90 SEIS

## ROAD LOCATION AND CONSTRUCTION RECOMMENDATIONS

(Block)

AREA # 3Reconned but locatedROAD NUMBER85367RESOURCERESOURCE CONSIDERATION/RECOMMENDATIONSCULTURALFISHERIESCLASS II crossing - see waterLANDSRECREATIONSee attachedSOILSNo concernsTIMBER(Silviculture/Logging System)VISUALSee AttachedWATERSee attachedWILDLIFE(See attached)

81-90 SEIS

## ROAD LOCATION AND CONSTRUCTION RECOMMENDATIONS

AREA # 3

located & SurveyedCorded vehicle use  
ROAD NUMBER

8538

<u>RESOURCE</u>	RESOURCE CONSIDERATION/RECOMMENDATIONS
<u>CULTURAL</u>	
<u>FISHERIES</u>	
<u>LANDS</u>	
<u>RECREATION</u>	<u>See Attached</u>
<u>SOILS</u>	No concerns
<u>TIMBER</u>	(Silviculture/Logging System)
<u>VISUAL</u>	<u>SEE ATTACHED</u>
<u>WATER</u>	See attached
<u>WILDLIFE</u>	(See Attached)

81-90 SEIS

## ROAD LOCATION AND CONSTRUCTION RECOMMENDATIONS

AREA # 3 not located Beyond Existing <sup>allow to grow closed</sup> ROAD NUMBER 8517

<u>RESOURCE</u>	<u>RESOURCE CONSIDERATION/RECOMMENDATIONS</u>
<u>CULTURAL</u>	

<u>FISHERIES</u>
------------------

No concerns

<u>LANDS</u>
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<u>RECREATION</u>
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See Attached

<u>SOILS</u>
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see attached

<u>TIMBER</u>
---------------

(Silviculture/Logging System)

<u>VISUAL</u>
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SEE ATTACHED

<u>WATER</u>
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CLASS III crossing.

see attached.

<u>WILDLIFE</u>
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(see attached)

## ROAD LOCATION AND CONSTRUCTION RECOMMENDATIONS

Block

AREA # 3 Not Located Beyond Existing ROAD NUMBER 85308

<u>RESOURCE</u>	RESOURCE CONSIDERATION/RECOMMENDATIONS
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<u>CULTURAL</u>	
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<u>FISHERIES</u>	
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CLASS II crossing - see water concerns.

<u>LANDS</u>	
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<u>RECREATION</u>	<u>See Attached</u>
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<u>SOILS</u>	No concerns
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<u>TIMBER</u>	(Silviculture/Logging System)
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<u>VISUAL</u>	<u>SEE ATTACHED</u>
---------------	---------------------

<u>WATER</u>	See attached
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<u>WILDLIFE</u>	<u>See attached</u>
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## ROAD LOCATION AND CONSTRUCTION RECOMMENDATIONS

Block to vehicles

AREA # 3 NOT Located Beyond Existing ROAD NUMBER 85307

<u>RESOURCE</u>	<u>RESOURCE CONSIDERATION/RECOMMENDATIONS</u>
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<u>CULTURAL</u>	
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<u>FISHERIES</u>	
------------------	--

*NO CONCERN'S*

<u>LANDS</u>	
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<u>RECREATION</u>	<i>See Attached</i>
-------------------	---------------------

<u>SOILS</u>	<i>no concerns</i>
--------------	--------------------

<u>TIMBER</u>	(Silviculture/Logging System)
---------------	-------------------------------

<u>VISUAL</u>	<i>SEE ATTACHED</i>
---------------	---------------------

<u>WATER</u>	<i>no concerns</i>
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<u>WILDLIFE</u>	<i>See attached</i>
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## ROAD LOCATION AND CONSTRUCTION RECOMMENDATIONS

*Block*

AREA # 3      Not Located      ROAD NUMBER 85342

<u>RESOURCE</u>	<u>RESOURCE CONSIDERATION/RECOMMENDATIONS</u>
<u>CULTURAL</u>	

<u>FISHERIES</u>	
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CLASS II-III crossing see water.

<u>LANDS</u>	
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<u>RECREATION</u>	<i>See Attached</i>
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<u>SOILS</u>	No concerns
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<u>TIMBER</u>	(Silviculture/Logging System)
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<u>VISUAL</u>	<i>See Attached</i>
---------------	---------------------

<u>WATER</u>	<i>See attached</i>
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<u>WILDLIFE</u>	<i>(See attached)</i>
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## ROAD LOCATION AND CONSTRUCTION RECOMMENDATIONS

AREA # 3      Reconuned Not Located      Conined access      ROAD NUMBER 85093

RESOURCE	RESOURCE CONSIDERATION/RECOMMENDATIONS
CULTURAL	

FISHERIES

See water

LANDS

RECREATION See Attached - Possible alpine trail starting from this road.

SOILS

It appears that the road location parallels and is west of a stream that flows into Freshwater Bay. The soils to the east of the stream have an extreme landslide hazard. Unless the actual road location is on or immediately below the hazardous slope, I have no soil concerns.

TIMBER

(Silviculture/Logging System)

VISUAL

SEE ATTACHED

WATER

See attached

WILDLIFE

(See attached)

# **Appendix A-2**

## **Unit Modifications: Reasons and Impacts**



## APC UNIT MODIFICATIONS FROM 1981-1986 PEIS

VCU	UNIT NUMBER	PLANNED ACRES	FINAL ACRES	< >	REASON FOR CHANGE	IMPACT OF CHANGE
204	110	70	77	7	ERROR IN EIS AREA DETERMINATION	NO CHANGE IN IMPACTS TO EIS
209	15	39	50	11	MODIFIED UPPER BOUNDARY TO PICK UP ISOLATED TIMBER	INCREASED UTILIZATION OF AVAILABLE TIMBER
16	40	41	1		ERROR IN EIS AREA DETERMINATION	NO CHANGE IN IMPACTS TO EIS
19	56	33	-23		BOUNDARY ADJUSTMENT DUE TO ADJACENT 86-90 UNIT	AREA DROPPED WAS ADDED TO 86-90 UNIT - NO CHANGE IN IMPACTS
20	31	34	3		ERROR IN EIS AREA DETERMINATION	NO CHANGE - LAYOUT AS PLANNED
27	46	44	-2		ERROR IN EIS AREA DETERMINATION	NO CHANGE - LAYOUT AS PLANNED
29	45	47	2		ERROR IN EIS AREA DETERMINATION	NO CHANGE - LAYOUT AS PLANNED
30	53	43	-10		ACRES DELETED TO AVOID EXTREME SOIL HAZARDS	REDUCED POTENTIAL FOR MASS SOIL MOVEMENT
5A	19	21	2		ERROR IN EIS AREA DETERMINATION	NO CHANGE - LAYOUT AS PLANNED
7	13	18	5		ERROR IN EIS AREA DETERMINATION	NO CHANGE - LAYOUT AS PLANNED
8	38	41	3		ERROR IN EIS AREA DETERMINATION	NO CHANGE - LAYOUT AS PLANNED
9	61	51	-10		ERROR IN EIS AREA DETERMINATION	NO CHANGE - LAYOUT AS PLANNED
12	86	111	25		ERROR IN EIS AREA DETERMINATION	NO CHANGE - LAYOUT AS PLANNED

APC UNIT MODIFICATION PROM 1986-1990 FEIS

209	5	20	21	1	ERROR IN EIS AREA DETERMINATION	NO CHANGE - LAYOUT AS PLANNED
6	75	89	14		INCREASED DUE TO BOUNDARY CHANGES TO PICK UP BLOWDOWN - MOVED BACKLINE TO RECOVER ISOLATED TIMBER AND MAKE MORE LOGICAL CUTTING BOUNDARIES REDUCED ISOLATED TIMBER STANDS ON THE BACKLINES	- RECOVERED BLOWDOWN TIMBER - REDUCED NEED FOR LATER ACCESS THRU PLANTATION - WINDPIRMED THE BOUNDARY INCR. ECONOMY OF YARDING & REDUCED LATER ACCESS & YARDING PROBLEM ASSOC. WITH EXISTING PLANTATION
10	51	62	11		REDUCED ISOLATED TIMBER STANDS ON THE BACKLINES PICKED UP BLOWDOWN - REDUCED ISOLATED TIMBER STANDS BETWEEN PLANNED UNIT BOUNDARY AND CREEK	INCREASED UTILIZATION OF TIMBER - RECOVERED BLOWDOWN & WINDPIRMED BOUNDARIES
15	20	59	39		INCREASED TO MAKE A MORE LOGICAL MANAGEMENT UNIT - ERROR IN EIS AREA CALCULATION	INCREASED -
16	45	71	26		REDUCED ISOLATED TIMBER STANDS - UNIT NOW FOLLOW A LOW TIMBER TYPE	INCREASED UTILIZATION & ECONOMICS
18	15	26	11		ERROR IN EIS AREA DETERMINATION	NO CHANGE - LAYOUT AS PLANNED
20	22	19	-3		ERROR IN EIS AREA DETERMINATION	NO CHANGE - LAYOUT AS PLANNED
27	34	37	3		ERROR IN EIS AREA DETERMINATION	NO CHANGE - LAYOUT AS PLANNED
29	67	73	6		ERROR IN EIS AREA DETERMINATION	NO CHANGE - LAYOUT AS PLANNED
30	38	10	-28		ACRES DELETED TO AVOID EXTREME HAZARD SOILS	REDUCED POSSIBLE SOIL MASS MOVEMENT
210	1	85	91	6	1 ACRE ADDED TO WINDPROOF BOUNDARY 5 ACRES DUE TO ERROR IN EIS AREA DETERMINATION	WINDPROOF BOUNDARY ON NE CORNER
3	143	149	6		ADJUSTMENT MADE TO WINDFIRM BOUNDARIES & PROTECT REGENERATION IN OLD BLOWDOWN AREAS	WINDPROOF BOUNDARY - PROTECT REGENERATION
4	100	129	29		ESTABLISHMENT OF MORE LOGICAL BOUNDARY AVOIDMENT OF WILDLIFE POND	WINDPROOF BOUNDARY - MORE ECON- OMIC & FEASIBLE TO LOG - REDUCE WILDLIFE IMPACTS AROUND POOL

5	29	38	9	UNIT ENLARGED ON NE END TO ESTABLISH A MORE LOGICAL CUTTING & PICK UP ISOLATED TIMBER	REMOVE ISOLATED TIMBER MORE ECONOMICAL & FEASIBLE TO LOG	
6	123	143	20	LOGICAL CUTTING BOUNDARY ADJUSTMENT - PROTECT WILDLIFE PONDS	REMOVE ISOLATED TIMBER MORE ECONOMICAL & FEASIBLE TO LOG	
7	126	82	-44	ACRES DELETED TO PROVIDE STREAM BUFFER ALONG CLASS A STREAM	PROTECTION OF WILDLIFE AND FISHERIES VALUES	
12	144	155	11	ERROR IN EIS AREA DETERMINATION	NO CHANGE - LAYOUT AS PLANNED	
13	59	50	-9	AREA DELETED TO PROTECT HAZARD SOILS AND MUSKEG	REDUCED IMPACTS TO MUSKEGS AND HAZARD SOILS	
15	144	135	-9	AREAS DELETED TO AVOID YARDING THROUGH V-NOTCHES AND PROVIDE A BUFFER ALONG STREAMS	REDUCED IMPACTS TO SOIL AND STREAM HABITAT	
16	53	31	-22	ACRES DELETED BELOW ROAD TO PROTECT BEACH PRINCE AND EAGLE NEST TREES	REDUCED IMPACTS TO WILDLIFE HABITAT	
17	28	29	1	ACRE DELETED WEST SIDE FOR VISUALS ACRE ADDED NE CORNER TO AVOID SPUR ROAD	INCREASED VISUAL QUALITY REDUCED ROAD COST	
18	39	22	-17	SOUTHERN 1/2 OP UNIT DELETED TO PROVIDE WINDPIRM BOUNDARY AND PROTECT EAGLE TREES	ASSURES PROTECTION OF EAGLE NEST	
213	6	62	53	AREA DELETED TO AVOID TOSING V-NOTCHES. PROTECT EAGLE TREES. & WINDPIRM THE BOUNDARY	ASSURES PROTECTION OF SOIL AND WILDLIFE VALUES	
7	58	45	-13	AREAS DELETED TO AVOID TOSING V-NOTCHES & PROTECT BEACH PRINCE AREA	REDUCE SOIL DISTURBANCE & PROTECT BEACH PRINCE HABITAT	
214	3	121	50	-71	AREA DELETED TO AVOID STEEP ROCK SLOPES. PROVIDE BUFFER ON SEAL CREEK AND AVOID V-NOTCHES	PROTECTION OF FISH VALUES, REDUCE SOIL DISTURBANCES
215	3	35	39	4	PICKED UP ISOLATED TIMBER	INCREASED UTILIZATION OF TIMBER
6	42	39	-3	ERROR IN EIS AREA CALCULATION	NO CHANGE - LAYOUT AS PLANNED	

14	50	68	18	MODIFIED UPPER BOUNDARY TO PICK UP ISOLATED TIMBER - LOWER BOUNDARY MOVED AWAY FROM CREEK	INCREASED UTILIZATION OF AVAILABLE SCREENED WILDLIFE FROM ROAD INCREASED WILDLIFE HABITAT		
17	47	54	7	INCREASED DUE TO BLOWDOWN & MOVEMENT OF BOUNDARY TO NOT ISOLATE TIMBER BETWEEN LOWER UNIT BOUNDARY & CREEK ERROR IN EIS AREA DETERMINATION	INCREASED UTILIZATION OF TIMBER REDUCED IMPACTS ASSOC. W/ LATER REMOVAL OF TIMBER THRU PLANTATION NO CHANGE - LAYOUT AS PLANNED		
25	47	49	2				
31	38	32	-6	ERROR IN EIS AREA DETERMINATION	NO CHANGE - LAYOUT AS PLANNED		
32	40	42	2	ERROR IN EIS AREA DETERMINATION	NO CHANGE - LAYOUT AS PLANNED		
33	56	55	-1	ERROR IN EIS AREA DETERMINATION	NO CHANGE - LAYOUT AS PLANNED		
34	25	20	-5	ERROR IN EIS AREA DETERMINATION	NO CHANGE - LAYOUT AS PLANNED		
214	184	23	27	4	ERROR IN EIS AREA DETERMINATION	NO CHANGE - LAYOUT AS PLANNED	
215	148	97	113	16	ERROR IN EIS AREA DETERMINATION	NO CHANGE - LAYOUT AS PLANNED	
154	20	19	-1	ERROR IN EIS AREA DETERMINATION	NO CHANGE - LAYOUT AS PLANNED		
156	15	18	3	ERROR IN EIS AREA DETERMINATION	NO CHANGE - LAYOUT AS PLANNED		
160	66	62	-4	ERROR IN EIS AREA DETERMINATION	NO CHANGE - LAYOUT AS PLANNED		
218	177	8	6	-2	ERROR IN EIS AREA DETERMINATION	NO CHANGE - LAYOUT AS PLANNED	
1129	1176	47		ERROR IN EIS AREA DETERMINATION	NO CHANGE - LAYOUT AS PLANNED		

7	26	32	6	ERROR IN EIS AREA CALCULATION	NO CHANGE - LAYOUT AS PLANNED
8	5	11	6	ERROR IN EIS AREA CALCULATION	NO CHANGE - LAYOUT AS PLANNED
9	45	18	-27	AREA REDUCED BY DELETING V-NOTCHES ON NW BOUNDARY	REDUCED SOIL DISTURBANCES - MORE ECONOMICAL TO LOG
10	12	10	-2	ERROR IN EIS AREA CALCULATION	NO CHANGE - LAYOUT AS PLANNED
217	1	18	-2	ERROR IN EIS AREA CALCULATION	NO CHANGE - LAYOUT AS PLANNED
2	54	28	-26	AREA DELETED TO PROVIDE BUFFER TO KENNEL CREEK, AVOID V-NOTCHES, AND PROTECTS STREAMS PICKED UP ISOLATED TIMBER	ASSURES PROTECTION OF KENNEL CREEK AND REDUCES SOIL DISTURBANCES INCREASED UTILIZATION OF TIMBER
33	37	44	7	ERROR IN EIS AREA CALCULATION	NO CHANGE - LAYOUT AS PLANNED
218	1	80	99	19	UNIT EXPANDED TO PICK UP BLOWDOWN
2	10	39	29	ERROR IN EIS AREA CALCULATION	INCREASES UTILIZATION - NO WILDLIFE CONCERN IDENTIFIED
19	23	20	-3	ERROR IN EIS AREA CALCULATION	NO CHANGE - LAYOUT AS PLANNED
31	21	40	19	ERROR IN EIS AREA CALCULATION	NO CHANGE - LAYOUT AS PLANNED
72	8	12	4	ERROR IN EIS AREA CALCULATION	NO CHANGE - LAYOUT AS PLANNED
74	9	15	6	PICKED UP ISOLATED TIMBER & ERROR IN EIS AREA CALCULATIONS	INCREASED UTILIZATION OF TIMBER NO IMPACTS
76	13	17	4	ERROR IN EIS AREA CALCULATION	NO CHANGE - LAYOUT AS PLANNED
79	12	10	-2	ERROR IN EIS AREA CALCULATION	NO CHANGE - LAYOUT AS PLANNED

	81	15	11	-4	ERROR IN EIS AREA CALCULATION	NO CHANGE - LAYOUT AS PLANNED
	219	22	24	34	AREA ADDED TO PICK UP BLOWDOWN	INCREASED UTILIZATION NO WILDLIFE CONCERNS IDENTIFIED
TOTAL	2186	2199	24	34	10	

\* NOTE: AREA CALCULATIONS IN 81-86 & 86-90 FEIS WERE ESTIMATED BY EITHER DIGITIZING OR DOT COUNTING. DIFFERENCES BETWEEN FINAL AND LAID-OUT OCCURRED AS INDIVIDUAL UNITS WERE TRAVERSED AND COMPARED - IN MOST CASES UNITS WERE LAID OUT AS PLANNED AND IMPACTS ASSOCIATED WITH THESE AREAS HAVE ALREADY BEEN EVALUATED IN THE FEIS.

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